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THIS MONTH

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Vol. XII JUNE, 1922 No. 6

SCHOOL HEALTH SUPERVISION BASED UPON AGE AND SEX INCIDENCE OF PHYSICAL DEFECTS

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Read at a Joint Meeting of the Public Health Administration and Child Hygiene Sections of the American Public Health Association, at the Fiftieth Annual Meeting, New York City, November 18, 1921.

A SURVEY of the systems of school medical inspection as carried on during the past fifteen years does not give us reason to feel that any definite advance, either in technique or method, has been apparent during that period, as far as the detection and correction of physical defects are concerned.

In this connection, it is interesting to trace briefly the history of school medical inspection in the United States. In 1894 Boston inaugurated the first system for the purpose of limiting the spread of infectious diseases. Similar methods were instituted in Philadelphia schools in 1896, and New York City started the same kind of work in 1897. At that time school medical inspection consisted solely in having physicians visit the schools each day for the purpose of inspecting all children referred by the teachers as suspected cases of contagious disease. If any possibility of infection was found to exist, the child was excluded and kept under proper quarantine until all danger of infection had passed.

The first marked advance in school medical inspection was inaugurated in 1905 in New York City, and consisted of a program which included making physical examinations of school children with the object of detecting any physical defects and obtaining the necessary medical or surgical care when indicated. Other cities and towns soon took up this type of health care in the schools and within a short interval it became the most prominent feature of school health work. At present, this type of school health supervision is mandatory in five states and permissive in twenty-nine states. The remaining fourteen states have no particular general laws relative to school medical inspection; nevertheless, some work of the kind is being carried on in nearly all of them.

The next advance in school medical inspection was health control of school children, including, as it does, the teaching of health habits. Extension of clinical facilities, special classes, and other health agencies should be mentioned, but the purpose of this paper is rather to deal with the question of the extent of physical defects among school children, the methods we are using to detect these defects, and the results that have been achieved through the use of these methods.

Early methods of detecting physical de-

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fects consisted in making physical examinations of the children, grade by grade, starting with children entering school for the first time. Under this system the total number of children examined each year depended upon the amount of money that had been appropriated for the purpose. Later other systems came into use; that is, the children were examined when they entered school for the first time, again in the third and sixth grades, and occasionally before leaving. This method differed from that commonly met with in Europe, where the practice has been to make a physical examination at the time the child enters school and again before it leaves. Within the past few years England has required a third physical examination at a time midway between the first and eighth grades.

As soon as physical examinations of school children were recognized in this country as being important in our health program, many of the states passed laws requiring such examinations to be made of each child once each year. Usually these laws left it for the local communities to raise the necessary money to pay for enforcement of this legislation. Probably everyone who has been connected with school health work is cognizant of the fact that few, if any, communities have ever been able or willing to appropriate sufficient money so that a complete and careful physical examination could be made of each child each year.

I do not think it is too much to say that the type of physical examination we have been making and the results that have been shown have given us no reason to congratulate ourselves either upon the thoroughness of our work or the essential rightness of our policy. We may assume that a thorough physical examination means exactly what is implied by the words. It does not mean a superficial inspection of the child, but does imply a careful determination of the child's physical condition and, consequently, takes time and inevitably costs money. In many cities of this country we have an annual or even more frequent inspection of the children. In very few can it be said that we have annual physical examinations, and even when the latter are carried on, we must acknowledge that they are unsatisfactory.

In some cities a medical inspection is frankly labeled with its real name, and such hasty inspections are often carried on as often as once a month. An inspection of each child to determine its health status has a certain value and is a perfectly legitimate part of any system of school medical inspection, but it cannot be stated too emphatically that these inspections are not physical examinations, and in all honesty should never be recorded under that name.

From studies made of appropriations of money in connection with the number of children to be examined in various communities, it seems evident that the laws which have been passed in regard to annual physical examinations of school children cannot be literally obeyed. Physical examinations take time and are expensive. In our desire to obey the letter of the law, we have neglected its spirit. Our present task is to place the work of physical examination of school children on a self-respecting basis, determine its necessity, the number of physical examinations the child requires during its school life, and the methods that should be used in order that these examinations may be productive of the greatest good.

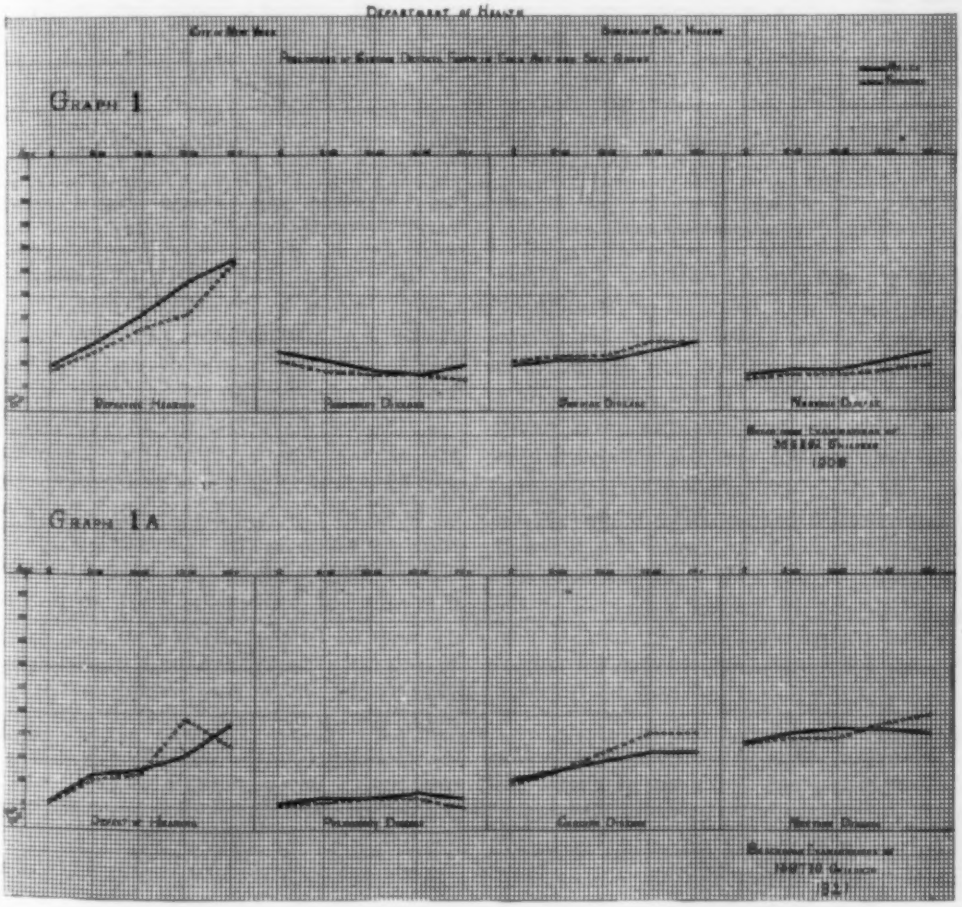
Another point with regard to physical examination of school children that we must all have noted is the remarkable uniformity of various communities as to the percentage of certain physical defects that are found each year. There has been very little, if any, change in this regard in the reports of cities and towns during the past ten years. We can state almost definitely in advance the relative percentage of defective vision, adenoid growths or hypertrophied tonsils that will be found in any community. Moreover, this percentage varies little from year to year. A statement of the actual

amount of work performed and the abnormal conditions existing has seemed in many instances to be the main factor in these reports.

May we not, then, acknowledge that with very few exceptions cities and towns are not prepared to spend the amount of money necessary to give each school child a complete physical examination each year? Ought we not also to acknowledge that our program for the physical examination of children has been based upon a desire to do a large amount of work and examine a correspondingly large number of children, rather than upon any definite scientific standard as to the number of times such examinations are needed, or as to the results we may reasonably expect to follow examinations of this type?

This being the case, is it not time for us to face the situation frankly, revise our programs in accordance with definite knowledge, and find out, if we may, how our limited funds can be spent in the way that will be most helpful to the children and in the most economical way as far as the community is concerned?

A study of the extent of physical defects among school children shows that almost universally approximately 35 per cent of the children of school age have one or more physical abnormalities, such as malnutrition, defects of hearing, lung disease, hypertrophied tonsils, adenoid growths, or defective vision. In this 35 per cent are included those who may have defective teeth associated with one or more of the other defects that have been mentioned. As far as defective teeth



INCIDENCE OF DEFECTS FOUND AMONG NEW YORK

(Based on 356,292 children examined in 1909; 139,770 in 1921) The upper row of figures in tive sex having a given defect. The lower row represents

	Number Examined		Defective Vision		Defective Hearing		Hyper. Tonsils		Defective Nasal Breathing	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Under 8	.....	.....	.....	.....	.5	.4	30.0	29.0	27.0	23.0
1909	96179	89528	.....	.....	480	358	28853	25963	25968	20591
	.....	.....	.....	.....	.1	.09	17.1	16.9	16.1	14.2
1921	37916	35309	.....	.....	40	33	6502	5967	6105	5042
8–10 years	.....	.....	12.0	14.0	1.0	.8	25.0	27.0	25.0	22.0
1909	44052	41551	5286	5817	440	332	11013	11218	10131	9141
	.....	.....	9.1	11.0	.7	.6	13.6	13.5	11.3	11.3
1921	14631	14899	1337	1653	102	96	2004	2022	1656	1696
10–12 years	.....	.....	17.0	21.0	1.6	1.3	24.0	27.0	23.0	26.0
1909	23100	22869	3927	4802	369	297	5544	6174	5313	5945
	.....	.....	11.5	13.7	.8	.7	12.5	12.7	11.7	10.2
1921	9114	8710	1054	1200	73	64	1141	1111	1071	896
12–14 years	.....	.....	19.0	24.0	2.3	1.6	25.0	27.0	21.0	27.0
1909	14553	14470	2765	3472	334	231	3638	3906	3056	3906
	.....	.....	12.2	13.7	1.1	1.9	11.9	12.0	9.5	8.4
1921	6917	6625	847	909	78	131	819	795	664	556
14 and over	.....	.....	21.0	22.0	2.8	2.7	21.0	22.0	18.0	21.0
1909	5180	4810	1087	1058	145	129	1087	1058	932	1010
	.....	.....	13.3	17.2	1.8	1.3	11.0	10.5	8.4	6.4
1921	2950	2699	394	466	55	37	326	284	249	175

alone are concerned, statistics are available to show that from 30 per cent to 65 per cent of the children who are otherwise normal have teeth that are in some degree defective. From our personal knowledge we may assume that every child between the ages of five and fifteen years needs dental care. Annual physical examination of these children will do no more than reveal the dental defects that we already know exist, and we have the knowledge at the present time that would lead us to believe that a system of oral hygiene reaching every child in the school is an essential part of our health program.

In order, then, to detect the physical defects that exist in 35 out of every 100 children, we annually examine 65 normal children in every 100, in addition to the 35 that are physically abnormal. Here at the outset is a waste of time and money, a waste, moreover, that results in hasty and inadequate attention to the children who are in urgent need of proper medical care.

In order to establish an economical and scientific basis for physical examination of school children, it is necessary for us to know the age and sex incidence of the occurrence of physical defects. School hygienists are, I believe, agreed that physical defects should be discovered as soon as possible after they first occur and before they have had time to give rise to the secondary symptoms or sequelæ which, by their severity, may often be of more importance than the original defect.

An attempt to solve some of these problems is the reason why the studies which are reported upon in this paper

CITY SCHOOL CHILDREN IN AGE PERIODS BY SEX

each age group and year represents the percentage of all children examined of the respec-
the total number of such defects found in each group.

	Defective Nutrition		Pulmonary Disease		**Cardiac Disease		*Nervous Disease		Defective Teeth		Ave. per 100† Tot. defects‡	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Under 8.....	3.6	3.9	.8	.6	.5	.6	.3	.2	62.0	61.0	124.	118.
1909.....	3462	3491	769	537	480	537	289	179	59630	54612	119931	106268
	17.0	16.7	.1	.08	.6	.5	.4	.4	60.3	57.7	113.	107.
1921.....	6452	5924	43	29	228	174	182	142	22876	20396	42779	38050
8–10 years.....	4.1	4.2	.6	.4	.6	.7	.4	.3	67.0	63.0	133.	132.
1909.....	1850	1703	264	166	264	290	176	125	29514	26177	58938	54969
	19.2	19.2	.2	.1	.8	.8	.6	.5	59.5	60.3	115.	117.
1921.....	2812	2856	30	21	124	130	96	77	8719	8997	16880	17548
10–12 years.....	2.8	3.6	.4	.3	.6	.7	.4	.3	53.0	51.0	122.	131.
1909.....	646	823	92	68	138	160	92	69	12243	11663	28364	30001
	20.5	21.0	.2	.2	1.0	1.2	.7	.5	53.9	52.7	113.	113.
1921.....	1876	1827	21	18	98	108	64	48	4916	4597	10314	9869
12–14 years.....	2.7	2.5	.3	.3	.8	1.0	.6	.4	47.0	44.0	119.	105.
1909.....	392	361	43	43	116	144	87	58	6839	3183	17270	15304
	17.9	17.4	.3	.2	1.2	1.6	.7	.8	44.4	42.9	99.	99.
1921.....	1244	1157	24	12	86	108	54	55	3074	2842	6890	6565
14 and over.....	2.4	2.2	.5	.2	1.0	1.0	.8	.5	42.0	43.0	108.	113.
1909.....	124	105	25	9	5	4	41	24	2175	2068	5621	5465
	14.7	15.1	.2	.07	1.2	1.6	.6	1.0	43.9	35.0	95.	88.
1921.....	435	406	7	2	36	44	19	28	1297	946	2818	2388

*Chorea of old table is compared with nervous disease in present table.
**Cardiac disease of old table is compared with cardiac disease organic of present study.
†Average number of defects found per 100 children examined (upper line).
‡Total number of defects found (lower line).

were undertaken. The purposes of the study were to determine:

1. When physical defects occur; that is, at what age they may be found for the first time.
2. How many physical examinations are necessary during the school life of the child.
3. When physical examinations are most necessary in relation to the age of the child.

In order to answer these questions in a direct way, a study was made in 1909 by the Bureau of Child Hygiene of the Department of Health of New York City. This study included an analysis of physical defects found in a total of 356,292 children who had been examined. Physical defects were tabulated by sex and age groups—6 to 8 years, 8 to 10 years, 10 to 12 years, 12 to 14 years and 14 years and over. In 1921 a similar study was made of 139,770 children of the same age groups in order to determine the different conditions, if any, existing at this later period and to determine whether or not post-war conditions have caused any alteration in either sex or age incidence of the physical defects in question.

The accompanying graphs show the results of both studies in detail, the table giving the figures upon which the graphs are based:

GRAPHS 1 AND 1A

Graphs 1 and 1A show the incidence of defective hearing, pulmonary disease, cardiac disease and nervous disease in the different sexes and in the various age groups. It will be seen that in both the 1909 and the 1921 studies these diseases show little variation during school life.

Defective Hearing: In the 1909 study defective hearing ranged from .5 per cent at the eight years and under period to 2.8 per cent at fourteen years and over. Here we have an increase during school life, common to both boys and girls, although it is neither marked nor extensive, and the total number of defects found comprises an inconsiderable percentage. Analysis of the causes of defective hearing would lead one back to the question involved in the prevention of infectious diseases, particularly scarlet fever. It is not probable that conditions of school life affect in any marked degree the prevalence of defective hearing in school children.

Practically the same conditions were found in the 1921 study, although here the incidence of defective hearing ranges from .1 per cent at eight years and under to 1.8 per cent in the twelve to fourteen year group. The analysis, however, would seem to be the same as that for the preceding study.

Pulmonary Disease: In the 1909 study pulmonary disease ranges from an average of .7 per cent at the eight year and under group to an average of about .4 per cent in the fourteen years and over group.

In the 1921 study pulmonary disease ranges from .1 per cent in the eight year group to .2 per cent in the fourteen years and over group.

There is, therefore, nothing to indicate that school life has any effect upon pulmonary disease; that is, as far as increasing its incidence is concerned. In fact, the general tendency in the earlier study was downward. In the later study the difference in incidence between the different age groups is so slight that it can hardly be marked. It is interesting also to call attention to the relatively small proportion of cases of pulmonary disease detected in school children at any age.

Cardiac Disease: In the 1909 study cardiac disease showed an average incidence of .5 per cent at eight years or under, rising to an incidence of 1 per cent at fourteen years and over.

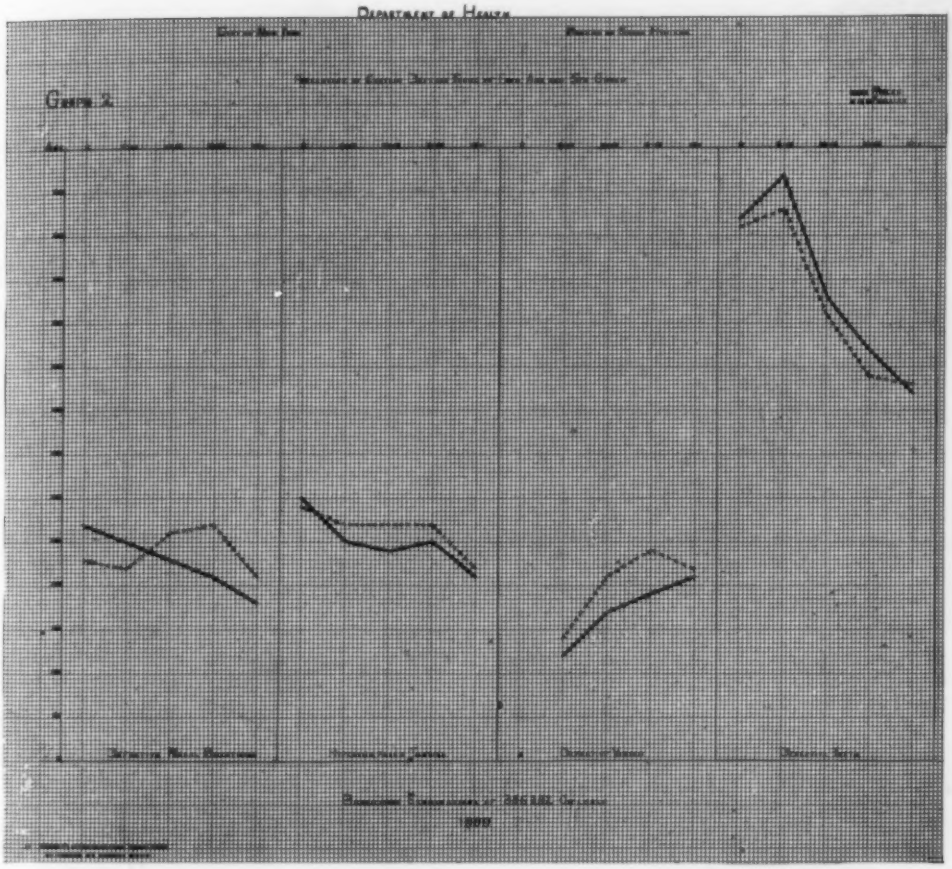
In the 1921 study a slightly higher incidence and greater increase is shown; that is, at eight years and under cardiac disease was present in .5 per cent of the cases and at fourteen years and over it was found in approximately 1.4 per cent of all cases examined.

Here, again, there is little to show the effect of school life upon the production of cardiac disease, the incidence remaining about the same throughout the life of the child. There is, however, a difference between the 1921 incidence and the 1909 incidence that may possibly be due to the fact that more attention has been paid to cardiac disease and may be accounted for by better methods of diagnosis. However, the increase is slight and the incidence itself small. Moreover, the incidence remains with slight variation almost the same throughout the school life of the child.

Nervous Diseases: In the 1909 study nervous diseases showed an incidence of .3 per cent at eight years and under, rising to .7 per cent at fourteen years and over.

In 1921 the incidence of nervous diseases at eight years and under was .4 per cent and at fourteen years and over approximately .8 per cent.

We have felt that school life was largely responsible for nervous diseases in children. These statistics would not seem to bear out such a conclusion, as the incidence in both studies remains about the same throughout the school life of the child, the upward tendency being very small and the total number of cases inconsiderable.



GRAPHS 2 AND 2A

Graphs 2 and 2A show the incidence of defective nasal breathing, hypertrophied tonsils, defective vision and defective teeth in various sex and age groups.

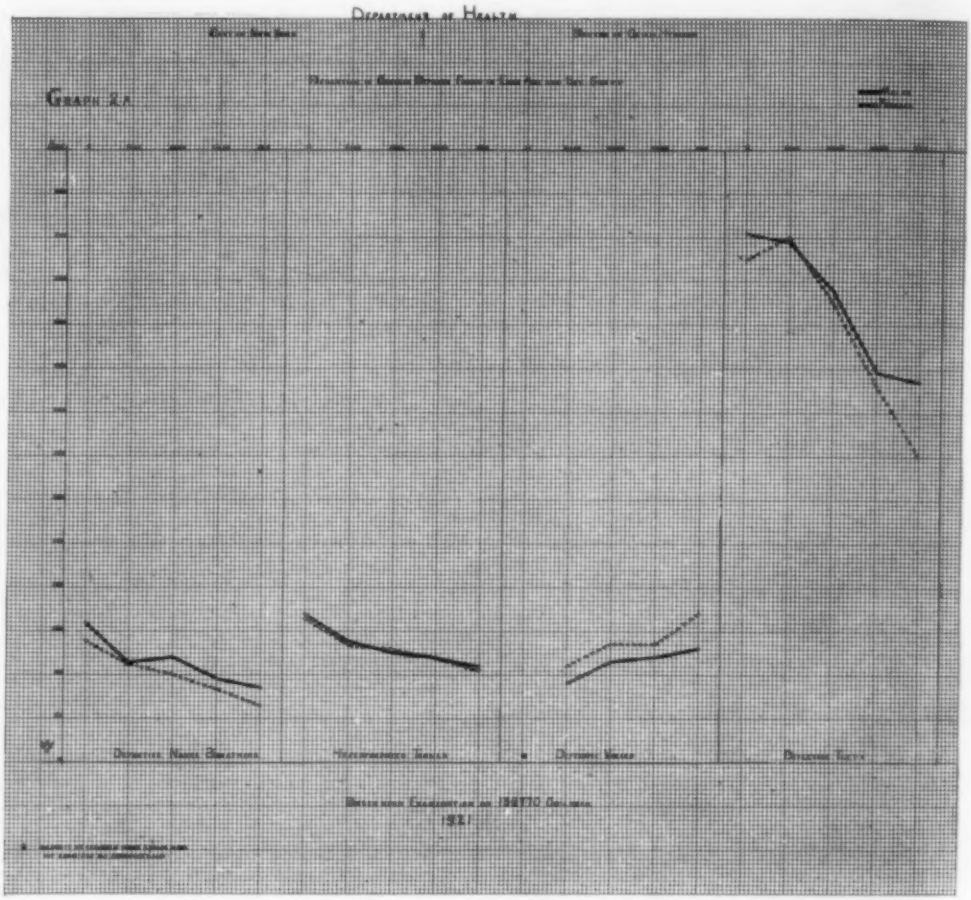
Defective Nasal Breathing: In the 1909 study defective nasal breathing was present in approximately 25 per cent of the children examined. In the case of boys its incidence shows a continuous decline to 18 per cent at fourteen years and over. With girls, a rise is shown from the eight to ten age group to the twelve to fourteen year group, and thereafter a decrease until the fourteen years and over period is reached, with an incidence of approximately 21 per cent.

In the 1921 study defective nasal breathing starts at an average of 15 per cent and shows a steady and persistent decline to about 7 per cent at the fourteen years and over group.

Hypertrophied Tonsils: In the 1909 report there was an average of about 30 per cent with a decline in a fairly irregular manner until it reached an average of 22 per cent at the fourteen years and over period.

In the 1921 study hyperthrophied tonsils were noted in 17 per cent of the cases at eight years and under, the incidence gradually decreasing to 11 per cent at fourteen years and over.

Defective Vision: In contradistinction to the two preceding defects, defective vision shows a persistent upward tend-



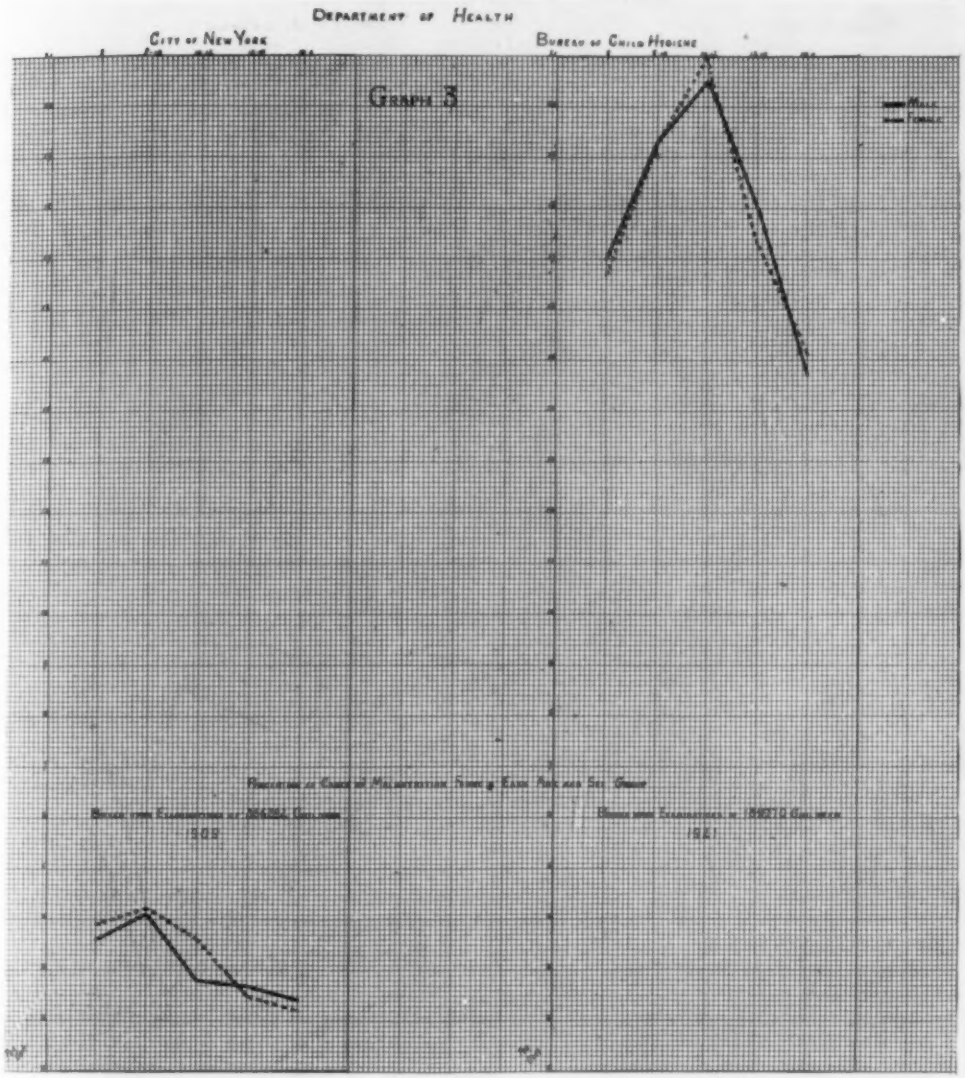
ency. In neither study—1909 or 1921—was any attempt made to test the vision of the children under eight years of age; so the statistics begin with the eight to ten year group.

In the 1909 study it was found that an average of 13 per cent of the children had some form of defective vision. This incidence increased throughout the school life of the child until at fourteen years and over 22 per cent of the children were found to have visual defects.

In the 1921 study 10 per cent of the children were found to have defective vision at eight to ten years and an average of 15 per cent at the fourteen years and over period.

Defective Teeth: In the 1909 study defective teeth were found in about 62 per cent of the cases in the eight years and under period. This incidence showed a sharp increase up to the eight to ten year group, thereafter showing an equally marked decline until at fourteen years and over the percentage of children with defective teeth amounted to about 43 per cent.

In the 1921 study the incidence of defective teeth in the eight years and under period was about 58 per cent. The decrease thereafter was fairly well marked until in the fourteen years and over group about 40 per cent of the children were found to have dental defects.

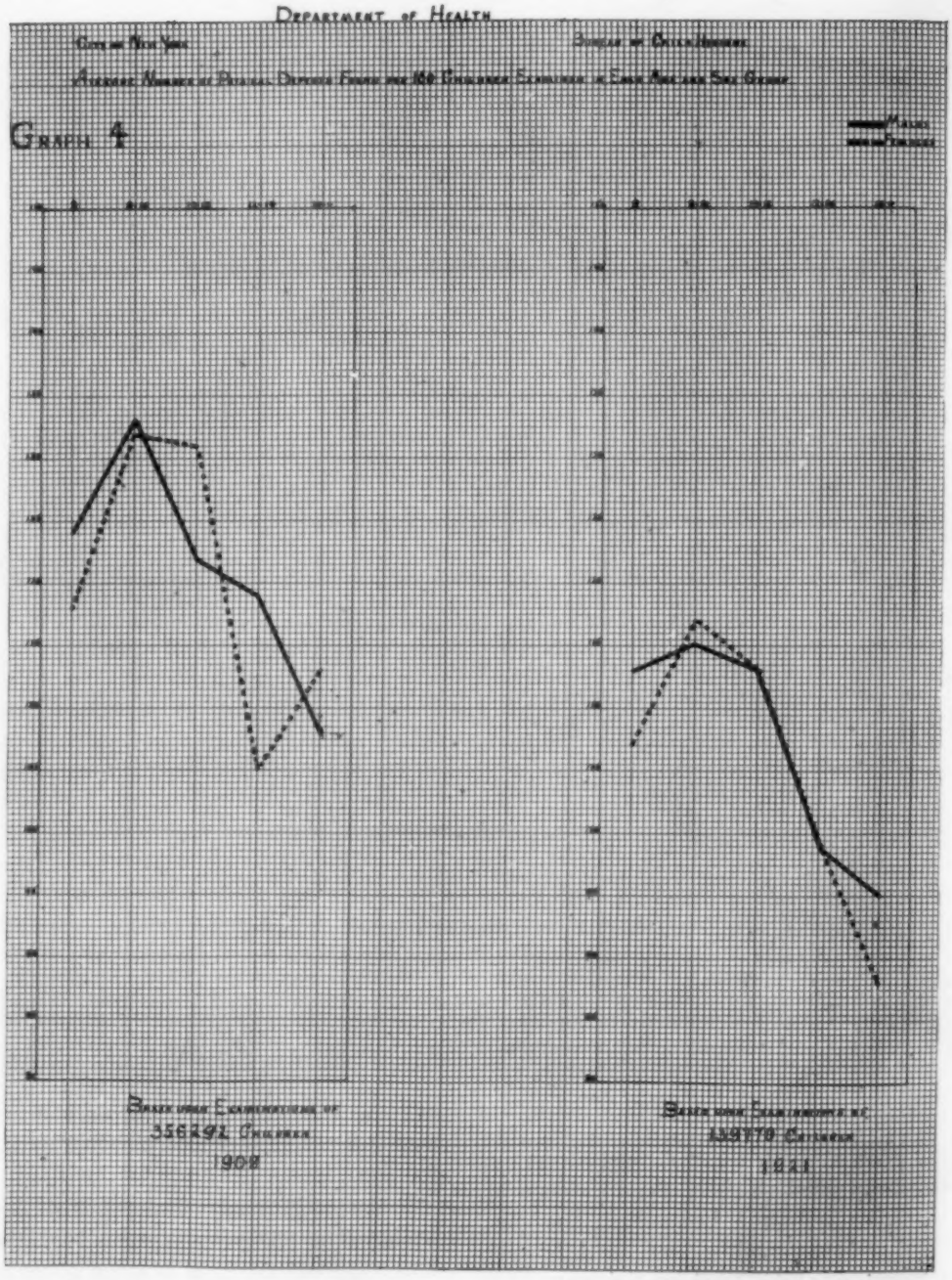


GRAPH 3

Defective Nutrition: A separate graph has been used to show the incidence of defective nutrition because in the case of this defect such a marked difference was found to exist between the years 1909 and 1921.

As may be seen, the study for 1909 showed that about 3.8 per cent of the children had defective nutrition at the eight years and under period. This percentage increased until the eight to ten year period was reached, then decreased until the fourteen years and over group when 2.3 per cent of the children examined were found to be undernourished.

In the 1921 study undernourishment showed a far different aspect. Here the percentage of nutrition is approximately 17 per cent at eight years and under. The incidence increased very rapidly until it reached 21 per cent at the ten to twelve year group then fell off with marked suddenness, so that the children in the fourteen years and over group showed approximately 15 per cent of undernourishment.



GRAPH 4

Total Number of Physical Defects Found in Each Age and Sex Group: Graph 4 is based upon the average number of physical defects found per 100 children in each of the various age and sex groups that have been studied. It may be seen that the 1921 study shows a marked reduction in the total number of physical defects as compared with the 1909 study, nevertheless, the relative age incidence of defects remains somewhat the same.

In the 1909 study there was an average of about 1.2 defects to each child examined in the eight years and under group. This rises gradually to approximately 1.33 defects to each child in the eight to ten year group and then shows a somewhat irregular decline to the fourteen years and over period.

In the 1921 study the average number of physical defects per child is 1.1 at eight years and under, increasing to approximately 1.15 per child at eight to ten years, then falling rapidly to an average of .93 per child at the fourteen years and over period.

SUMMARY

In analyzing the results of this study in physical defects found in school children, the following points seem worthy of emphasis:

1. The less common and more chronic defects, such as pulmonary disease, cardiac disease and nervous disease remain at about the same level throughout school life, and are apparently influenced little, if at all, by the school environment.

2. Defective hearing and defective vision show a steady and persistent increase from the entering age to the leaving age throughout the school life of the child. In the case of defective hearing, however, the increase is relatively small; in the case of defective vision, the increases is more marked.

3. Malnutrition, defective nasal breathing (implying the presence of adenoids), hypertrophied tonsils or diseased tonsils and defective teeth show their highest incidence either at the entering age or at the eight to ten-year period, thereafter showing a fairly persistent and regular decline.

4. While the incidence of physical defects in all age groups is lower in the 1921 study than in the 1909 study, the relative age incidence remains approximately the same, the percentage of defects found at each age bearing about the same relative position in both studies.

5. The physical examinations and follow-up work for school children in the years intervening between 1909 and 1921 have evidently reduced the total number of physical defects, with a resultant raising of the health standards of the children examined. They have not, however, resulted in a change in the relative age ratio of the physical defects encountered.

CONCLUSIONS

The conclusions reached as a result of this study are:

1. The most important physical examination to be made in the school life of the child is the one occurring at the time the child enters school for the first time.

2. In order to make the work of health supervision of school children effective, a complete physical examination of each child should be made before the eight to ten year period. If this can be done with 100 per cent efficiency, combined with follow-up that is 100 per cent effective and 100 per cent of treatments obtained, it should not be necessary to make regular physical examinations after the eight to ten year period, reliance being placed after that time upon the routine inspection of the children in the class-room. This routine inspection will permit the nurse, doctor or teacher to pick out the cases of physical defects that have been in any way overlooked during routine physical examinations or which have originated after the eight to ten year period.

3. An annual test for defective vision is desirable.

4. Unless the amount of money appropriated for school medical inspection is large enough to allow a complete and thorough physical examination each school year, the officials in charge of such work are not justified in spending any money in having physical examinations made after the eight to ten-year period unless the full health needs of the children below that age period have been met.

5. A logical deduction that might be drawn from this study is that great emphasis should be placed hereafter upon the preschool age period as the time when physical defects should be prevented or corrected.

6. To sum up the matter, this study would seem to show that the expenditure of time and money to make annual physical examinations of school children is not warranted and seems to be unnecessary. Analysis of the age and sex incidence of physical defects in this study shows that proper and adequate physical examinations made in the early life of the school child—that is, before the eight to ten-year period—are essential, and if these are properly followed up and suitable treatment obtained, the appropriation for this work will be spent in the most economical way, the child's health will be more thoroughly protected and future disease and the sequelæ of physical defects be more adequately guarded against than by any of the present methods of school health supervision.

□

INFLUENZAL MENINGITIS

T. M. RIVERS, M.D.

Department of Pathology and Bacteriology, Johns Hopkins University

Read before the Laboratory Section of the American Public Health Association, at the Fiftieth Annual Meeting, New York City, November 14, 1921.

THE study[1] of thirteen strains of influenza bacilli isolated from the meninges or spinal fluids of patients with influenzal meningitis showed that eleven were alike culturally. These eleven strains were closely allied, as shown by agglutination tests. By absorption of the agglutinin test two main groups were found: Group I of seven strains, Group II of three strains, and one intermediate strain. From three of the patients with meningitis, blood culture strains also have been studied. These belong to the same group as the corresponding meningeal strains. This is contrary to the findings of Anderson and Schultz[2] who reported that the meningeal strain and the blood culture strain from the same patient were different immunologically. Fourteen strains from sputa, lungs and bronchi, and four blood culture strains from patients with pneumonia following influenza have been compared with these meningeal strains. Many of the respiratory strains were different from the meningeal strains culturally, and none of the respiratory strains studied was identical by absorption of the agglutinin test with the meningeal strains.

These facts suggested that influenza bacilli causing meningitis might be a group by themselves. Even though *B. influenzae* should not be the cause of influenza, it would be hard to deny the presence of these organisms in increased numbers during the last epidemic of influenza. Then, if the respiratory strains were the cause of meningitis, an increase in influenzal meningitis should have occurred during the epidemic of influenza regardless of the etiology of influenza. In Chicago[3] there was no increase of influenzal meningitis during the epidemic of influenza. In New York[4] only one case occurred during the epidemic of 1918. There was, however, a slight increase in the number of cases for the years 1916, 1917, 1918 and 1919. In Baltimore, on the other hand, there was a distinct increase during the years 1917, 1918, 1919 and 1920. In spite of this increase, no definite relation between influenza and

influenzal meningitis can be discovered, as the majority of the cases of the latter disease did not occur during the epidemics of influenza.

The meningitic strains of *B. influenzae* are not the same as the respiratory strains isolated at that time. One hundred and ninety-three cases of influenzal meningitis have been collected from the literature, and the striking thing is that the greatest number that occurred in one year was in 1910 when there had been no epidemic of influenza and when many of the investigators reporting the cases could not find *B. influenzae* in the usual yearly run of grippe patients. In different localities there seems to be a marked fluctuation in the number of cases of influenzal meningitis, and some[5] go so far as to speak of little epidemics of this disease. In the majority of the reported cases, and of the twenty-two seen in Baltimore, the meningitis followed no other infection; it seemed primary, and many of the autopsies revealed no condition to which the meningitis might have been secondary.

Pneumonia in Baltimore is more prevalent after Christmas. Most of the influenzal meningitis occurred during the months of October, November, December and January before the pneumonia season begins. The majority of the cases of influenzal meningitis reported by Neal[4] in New York occurred during the months of October, November and December. In 1911 Holt[6] showed that in New York the curve of tuberculous meningitis, plotted by months, follows the curve of deaths from pneumonia. The peaks of these curves come well after Christmas, in March and April. The etiology of tuberculous meningitis and ordinary pneumonia can not be confused, and Holt suggested that the curves paralleled each other because acute respiratory diseases tended to cause a flare up and a dissemination of tuberculosis. In the past, influenzal meningitis has been considered by some observers secondary to influenza or other acute respiratory diseases,[7] yet the curve of influenzal meningitis does not follow the curve of deaths from pneumonia as well as tuberculous meningitis does.

A certain number of cases of influenzal meningitis, these, however, well in the minority, are without a doubt secondary to mastoid and other similar infections. The strains of influenza bacilli producing the meningitis under these conditions may be like other respiratory strains in regard to virulence, biological and serological reactions. The failure to recognize the various groups of influenza bacilli may account for the multiplicity of opinions about the meningitic strains, as well as about the respiratory ones.

The facts presented suggest that influenzal meningitis in many instances may be a disease caused by a special group of organisms. In view of these facts further efforts to prove or disprove this statement should be made. In the meantime an antiserum to the proper strains should be used in treating influenzal meningitis.

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**Remember the Fifty-first Annual Meeting,
Hotel Statler, Cleveland, Ohio, October 16-19, 1922.**

A STUDY OF THE PRACTICAL VALUE OF THE FROST LITTLE PLATE METHOD IN THE ROUTINE COLONY COUNT OF MILK SAMPLES

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THE method of growing bacteria in solid media on sterile slides was applied by W. D. Frost in 1915 to the routine bacteriological examination of milk. It was called by him the "little plate" method.

This method is a modification of the standard plate method for milk analysis in that the standard agar for milk work is used and the result obtained is a computation of the number of colonies per cubic centimeter of milk developing under conditions essentially those of the standard plate procedure. Since 1915, Frost, working at the University of Wisconsin, has repeatedly modified and simplified the technic and improved the necessary apparatus.

The present technic of the little plate method is not difficult. An assistant with good general laboratory training can learn to make the test without difficulty; workers with less general experience gain proficiency more slowly, but a few days' practice will usually suffice for accurate results.

The method* in brief is described by its author as follows:

Two areas of four square centimeters each are marked off with a wax pencil on an ordinary microscopic slide which has been carefully polished. The slide is sterilized by passing it back and forth through a Bunsen flame. It is then laid on the flat top of a copper box containing water at a temperature of 42°-45° C. The milk sample is shaken gently to avoid the formation of foam, then 0.05 (1/20) c.c. of the milk is measured from a "serum pipette" (a narrow, accurately calibrated pipette measuring 0.2 c.c. graduated to 0.01 c.c.) on to the ruled area at the left end of the slide, and the same amount on the right end of the slide. An approximately equal amount of sterile nutrient liquified agar at 42°-45° C. is added by allowing one drop to fall from a 1.0 c.c. pipette upon each measured drop of milk sample.

The milk and agar are thoroughly mixed with a sterile loop and carefully spread over the marked-off areas. This gives duplicate films. The preparation is set aside to solidify on a level surface under cover, and then, before the agar begins to dry down, the slide is placed in a moist sterile chamber. This moist cabinet is set in the incubator. The period of incubation should be long enough to allow the bacteria to grow into definite colonies, although they need not necessarily be visible to the naked eye. It is stated that four hours' incubation at 37.5° C. allows the formation of good-sized colonies if the bacteria are actively growing in the milk at the time of testing. If the milk has come from cold storage, has been pasteurized, or is fresh and contains few bacteria, then seven or eight hours are necessary. If there is no particular hurry about the results, the plates can be left in the incubator from one day to the next, i. e., for fifteen or sixteen hours.

When the slides are removed from the moist chamber after incubation, they are dried immediately at a temperature of about 95° C. If only a few slides are to be dried, they can be laid on the surface of the above mentioned copper box, which will give a temperature of about 95° C. if the box is filled with boiling water. Where large numbers of slides are to be dried, an electric oven is necessary. This temperature dries the agar films quickly enough to prevent the film from cracking or peeling. The drying is accomplished in five minutes or less.

The slides are now ready for staining. They are first immersed for a minute or two in 95 per cent alcohol containing 10 per cent of glacial acetic acid to prevent the agar back-

*Frost, W. D., Improved Technic for the Micro or Little Plate Method of Counting Bacteria in Milk. *Jour. Inf. Dis.*, Vol. xxviii, No. 2, p. 176.

ground from taking a deep stain. The acid alcohol is drained off and the slides are then put into the stain. This may be either Loeffler's methylene blue diluted with three times its volume of distilled water, or thionine blue made up with carbolic acid and distilled water with the addition of acetic acid. The stain will act sufficiently in about two minutes, but no harm will result from a longer exposure. The slides should be thoroughly washed in tap water, then dried at about 95° C. on a hot plate or in an electric oven as described above.

The counting is done under a compound microscope. If the colonies are small or very numerous the higher powers must be used; if the colonies are larger and fewer the low power may be used. A number of fields are counted and an average count per field obtained. In order to express the result of the count in terms of "colonies per c.c." of milk, it is necessary to know the area of the microscopic field. To determine this, the diameter of the field is read off on a stage micrometer, the radius is obtained by dividing the diameter by two and the following geometrical formula applied:

The area of a circle=radius squared X 3.14159

Then divide the area of the microscopic field into the total area of the film (4 square centimeters) and multiply the result by 20 because only 0.05 c.c. of milk is used to make the test. The result is a constant by which the average count per field must be multiplied in order to convert it into "colonies per c.c." of milk. This multiplier is a constant for each combination of lenses so tested but must be determined again for each microscope and for each new combination of lenses.

Heavily contaminated milk samples require dilution before this test can be carried out. The dilution advised is 1.0 c.c. of the milk to be tested in 9.0 c.c. of sterile milk. After thorough mixing, the diluted sample is used in exactly the same way as the ordinary sample. Another way, simpler than this, is also recommended: 0.01 c.c. or 0.02 c.c. of the undiluted milk sample is pipetted on to the ruled slide, a drop of warm sterile milk and the usual drop of agar added,—the whole mixed and spread in the usual way.

The advantages claimed by Frost for the little plate method are:

1. The time required to set up the little plate test is less than that needed for the standard plate test.
2. The incubation period is shortened so that routine results can be obtained in twenty-four hours and, in special cases, results can be obtained the same day.
3. The technic of the little plate method is simpler than the technic of the standard plate method.
4. The little plate method requires less material in the way of glassware and media. There is a corresponding saving of labor and expense in preparing these supplies.
5. It permits a study of a relatively large amount of milk, usually 0.05 c.c.
6. The slides are permanent preparations and can be filed for record and reëxamined whenever the need arises.
7. The method furnishes direct information about the types of organisms present, their relative numbers, etc.
8. It is a method easily adapted to field work.

To determine how far the Frost little plate method is applicable to the work of a large routine milk laboratory run for administrative purposes, we have carried out an extensive series of tests on all grades of milk, controlling the test in all cases by standard plate counts. Whenever it was possible to do so, the standard plate was made in duplicate. A few minor changes have been made in the Frost technic where such modifications would expedite the work or make the test more like the standard plate method.

Our most important modification of Frost's technic concerns the shaking of the milk sample. Frost tips the sample bottle from end to end slowly enough to avoid the formation of foam, since air bubbles drawn into the pipette would interfere with the accuracy of measurement. For routine work, the manner of shaking milk samples is minutely prescribed by standard methods; it is a vigorous shake and will break up clumps more than the shaking recommended by Frost. In order to make a comparative study, with the standard plate results as

the basis for comparison, it seemed essential to shake the milk sample in the same manner for both tests. In our laboratory, therefore, the sample is shaken in the manner prescribed by standard methods and then both tests are immediately carried out. Tipping the bottle after shaking causes the foam to float to one side and the milk can be drawn into the pipette without including air bubbles, thus overcoming the objection mentioned by Frost.

To save the time consumed in ruling the slides, a Wolf-Hugel counting plate is placed upon the warm box and the sterile slides placed upon the counting plate. The ruled lines of the counting plate are clearly seen through the slide and the milk-agar mixture is carefully spread over four square centimeters of the slide as defined by the lines beneath. Although we lose the advantage of having the mixture flow back from a greased line, we accomplish a slight saving in time on each test and this saving becomes considerable as the number of tests increases.

After staining the film, we prefer to decolorize slightly. This technical point was mentioned by Frost in his earlier articles, but is not mentioned in his most recent article. The count seems to be uninfluenced by decolorization if this is not carried too far. A few seconds in alcohol are all that should be allowed. Films that have been overdecolorized may easily give too low a count as unstained colonies cannot always be picked out with accuracy.

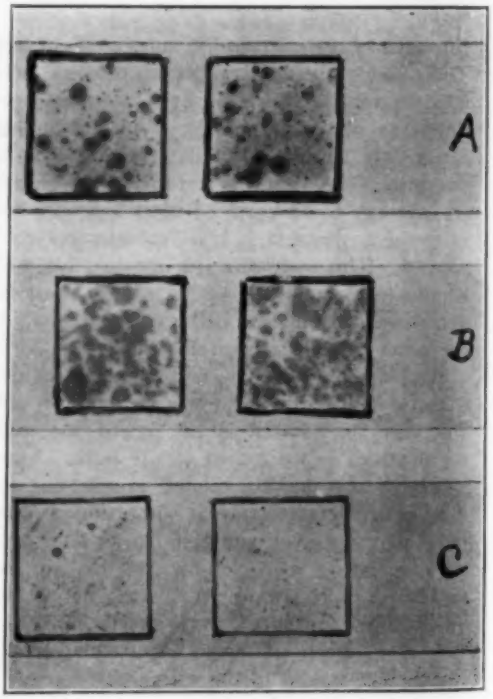
The accompanying photograph shows the stained preparation ready for counting.

In all the work used as the basis for this article, only one-time period for incubation has been employed. The moist chamber containing the slide preparations was put into the incubator at 5 p. m. and was taken out at about 8 a. m., thus making a fifteen to sixteen hours' incubation. As pointed out by Frost, it is desirable to incubate over night when dealing with the test in a routine way, otherwise it is necessary to be at the laboratory out of hours. With a large volume of routine work, the overnight incubation is important to the indorsement of the method. Although Frost's work is based upon an incubation period of four to eight hours, the overnight incubation is equally recommended by him. It is probable that any difference in results is rather in the size of the colony than in the count.

When we began this work, colony counts were made in an absolutely mechanical way by counting five or ten fields of each film, going diagonally across the film in both directions and averaging these results. As the work went on, however, and our experience grew, we

PLATE SHEET

The appearance of the little plates after staining is shown in the accompanying photograph.



Little plates in duplicate on slides after staining (fifteen hours incubation).
A—Moderate number of colonies.
B—High count, more uniform colonies.
C—Small number of colonies.

TABLE I. COMPARATIVE COUNTS ON MILK SAMPLES WITH SPECIAL REFERENCE TO THE USE OF VARIOUS OBJECTIVES.

COLONIES PER C.C. OF MILK.

Sample No.	Frost Little Plate Method				Standard Plate Method	
	Amount Tested	#3 Objective	#6 Objective	Oil Immersion	Dilution Used	Count per c.c.
1	.05 c.c.	Overcrowded	.....	2,360,000	.....	.....
	.01 c.c.	2,741,892	2,624,958	2,000,000	1:1,000	2,500,000
2	.05 c.c.	37,996	60,416	90,000	1:1,000	65,000
	.01 c.c.	*	*	*		
3	.05 c.c.	172,983	183,330	220,000	1:1,000	224,000
	.01 c.c.	114,433	187,497	too few	1:10,000	210,000
4	.05 c.c.	34,330	70,832	80,000	1:1,000	45,000
	.01 c.c.	*	*	*		
5	.05 c.c.	Overcrowded	1,894,279	1,973,552	1:10,000	11,000,000
	.01 c.c.	4,452,000+	4,977,989?	3,788,515		
6	.05 c.c.	595,720	572,689	722,461	1:10,000	1,200,000
	.01 c.c.	1,297,440	678,416	704,840		
7	.05 c.c.	Many millions	Many millions	Many millions	1:100,000	223,200,000
	.01 c.c.	Many millions	Many millions	Many millions		
8	.05 c.c.	Overcrowded	4,390,000?	Colonies run together	1:100,000	27,000,000
	.01 c.c.	11,872,000	14,096,960?	7,224,610		
9	.05 c.c.	1,225,360	1,057,272	1,074,881	1:10,000	2,400,000
	.01 c.c.	1,250,800	1,718,067	1,057,250		
10	.05 c.c.	Many millions	Many millions	Colonies run together	1:10,000	124,620,000
	.01 c.c.	Many millions	10,572,720	9,162,920		
11	.05 c.c.	Overcrowded	1,392,075	1,797,342	1:1,000	3,200,000
	.01 c.c.	3,697,280	2,731,286	2,746,655		
12	.05 c.c.	529,900	405,288	334,799	1:1,000	776,000
	.01 c.c.	712,320	616,742	792,945		
13	.05 c.c.	Many millions	Many millions	Many millions	1,10,000	137,640,000
	.01 c.c.	Many millions	Many millions	32,775,060+		
14	.05 c.c.	3,595,520+	4,365,330?	2,625,529	1:10,000	10,800,000
	.01 c.c.	6,784,000+	5,286,360?	Colonies indistinct		
15	.05 c.c.	850,120	740,090	599,114	1:10,000	1,100,000
	.01 c.c.	1,036,680	660,795	Growth too diffuse		
16	.05 c.c.	295,104?	208,376	881,050?	1:100	273,000
				Diffuse growth	1:1,000	400,000
	.01 c.c.	560,740	*186,050	*176,210?	1:10,000	350,000
17	.05 c.c.	62,208	54,573	*	1:100	36,000
	.01 c.c.	58,300	*	*	1:1,000	51,000
					1:10,000	120,000
18	.05 c.c.	24,168	24,807	*	1:100	24,000
	.01 c.c.	27,560	*	*	1:1,000	28,000
					1:10,000	100,000
19	.05 c.c.	366,316	282,796	328,925	1:100	227,500
	.01 c.c.	312,640	*	*	1:1,000	584,000
					1:10,000	500,000
20	.05 c.c.	35,616	*	*	1:100	28,800
	.01 c.c.	46,640	*	*	1:1,000	53,000
					1:10,000	60,000

Samples Nos. 3, 5, 7, 10, 13, 16, 19 were diluted 1:10 to make samples Nos. 4, 6, 8, 11, 14, 17, 20 and these in turn were diluted 1:10 to make samples Nos. 9, 12, 15 and 18.

NOTE: These milks contained an excessive number of lactic acid bacteria, having been incubated at room temperature over night.

*Too few for accurate count.

found that with ordinary care in making the films, the colonies were so evenly distributed that equally accurate results could be obtained by counting two or three representative fields from each film. It is preferable to do this with a mechanical stage.

Some of the assistants in our laboratory have also been tried out on the counting. They have required little practice before obtaining counts very like our own. It must be borne in mind, however, that these girls have had years of experience in counting milk plates. Their opinion is that the stained little plate preparation is easier to count and entails less eye strain than does the standard milk plate.

As a rule, the count is not radically affected by the choice of an objective. (See Table 1.) Of course, where the count is very low, the oil immersion is impracticable because many fields will show no colonies; hence it is difficult to get a true average count per field, and the factor for multiplication is so large that a slight variation in the average count is multiplied enormously.

If the milk has a very high bacteria content, the field under the low power is too overcrowded to be accurately counted and the oil immersion is much more satisfactory. In the latter case the count may be too low even with the oil immersion because of the inhibition of colony development due to overcrowding, hence the testing of a smaller amount of milk is indicated.

In either case, the important fact for grading purposes is easily ascertained—a very high or a very low count is quickly recognized and a medium count can be made with any objective. Occasionally a milk is found which gives a higher count when the magnification is increased. This may be due to a different type milk or to artifacts. (See Table 2.) These cases require further study. In this connection, it must be borne in mind that the oil immersion shows the individual bacteria and that clumps of these cannot, at times, be differentiated from beginning colonies. The possible effect of an unusual flora is shown by the following case:

Thirty-nine samples of pasteurized milk, all from one source, were run in parallel by the two methods. The standard plates gave counts ranging from 62,000 to 710,000 per c.c. and showed apparently an almost pure culture of an organism producing extremely small colonies. The Frost plates all gave counts under 10,000 per c.c. when examined with the No. 3 objective. With the No. 6 objective the counts were somewhat higher. With the oil immersion lens very few colonies could be found, but many fields showed a mass of organisms numbering many hundreds, all of the same general appearance, but no denser or more deeply stained in one part of the mass than in another.

Table 2 gives results on five of these samples picked at random.

TABLE 2.

EFFECT OF PRESENCE OF UNUSUAL FLORA

Little Plate Counts Increased with Increased Magnification. Standard Plate Counts Still Higher

Sample No.	Standard Plate Count	Frost Little Plate Count		
		No. 3 Objective	No. 6 Objective	Oil Immersion Objective
894	91,000	6,500	33,333	Diffuse growth instead of colony formation. No Colonies seen.
4062	92,000	6,000	37,499	
7042	62,000	5,333	41,666	
7456	110,000	10,322*	41,666	
599	192,000	2,333	41,666**	

*Possibly much higher count.
**Very indistinct.

In general, the lowest possible magnification consistent with accuracy should be used, because it requires the smallest factors for multiplication and because the oil immersion introduces the danger of including the above-mentioned clumps in the colony count.

The making of proper dilutions in a rapid manner is a matter of great importance. It is true equally for the standard plate and for the little plate that the amount of milk tested should depend upon the probable bacterial content of each sample as indicated by the grade designated on the label. Where the counts are actually far in excess of this, conditions are not suitable for the development of all potential colonies and the count per c.c. is less than it would have been from a higher dilution.

For the better grades of milk, the samples were tested undiluted, using 0.05 c.c. of milk and about an equal amount of agar. For the more highly contaminated milks various ways of examining a smaller portion of milk were tried in order to give the potential colonies room to develop. This, of course, meant a higher factor to be used as a multiplier for the average field. At first, the samples were diluted 1:100, using sterile milk as a diluent; of this dilution, 0.05 c.c. was plated. This technic was unsatisfactory because there were too few colonies in the film.

Next, the milk sample was similarly diluted 1:20 with sterile milk and the usual 0.05 c.c. plated. This method was more satisfactory than the dilution of 1:100, yet often even the 1:20 dilution gave films showing too few colonies. In any case, the making of a dilution was time consuming and we wished to do the work more directly if possible. To this end we tried the examination of 0.01 c.c. of undiluted milk, adding to it 0.04 c.c. of sterile milk and the usual drop of agar. This procedure was time consuming also and the 0.01 c.c. of milk begins to dry down before the sterile milk can be accurately measured and added.

The method in use by us at present for the testing of highly seeded milk samples, consists in the examination of two different quantities of the undiluted milk sample, 0.05 c.c. on the left end of the slide and 0.01 c.c. on the right end of the slide without the addition of sterile milk. This has the advantage of simplified technic and the elimination of a sterile diluent with its attendant work of preparation and possibility of contamination. The lessened milk content of one of the finished preparations does not seem to make as much difference in the count as we anticipated. Although it is easily conceivable that milks containing large numbers of certain types of lactic acid bacteria would fail to show a corresponding colony count in the film containing less milk, yet the same objection is true of the standard plate which actually contains even less milk. As this is a study based on comparisons with the standard plate results, we believe that the above procedure is admissible. Moreover, the finding of a reasonable colony count ratio between two films containing different amounts of the same milk sample is reassuring. It is comparable to the colony count ratio between two or more standard plates containing different quantities of a given milk sample. In each case, due allowance is made for inhibition due to overcrowding. For field work, the elimination of a sterile diluent also means fewer supplies to carry about, a less complicated procedure in an improvised workroom and a shorter time required for setting up the test.

The results of our work, on the whole, have been more clear-cut than we had anticipated. The certified milks showed the smallest average variation from the standard plate result. The pasteurized milks and raw milks to be pasteurized gave greater variations, these being divided about equally between results greater than standard plate counts and results less than standard plate count and ranging from — 28.6 per cent to + 18.7 per cent. Table 3 presents an analysis of the counts obtained from 241 samples of milk tested by both methods. Only recent results are tabulated here because they represent a more experienced handling of the little plate method and the use of 0.05 c.c. and 0.01 c.c. of undiluted samples of raw milk.

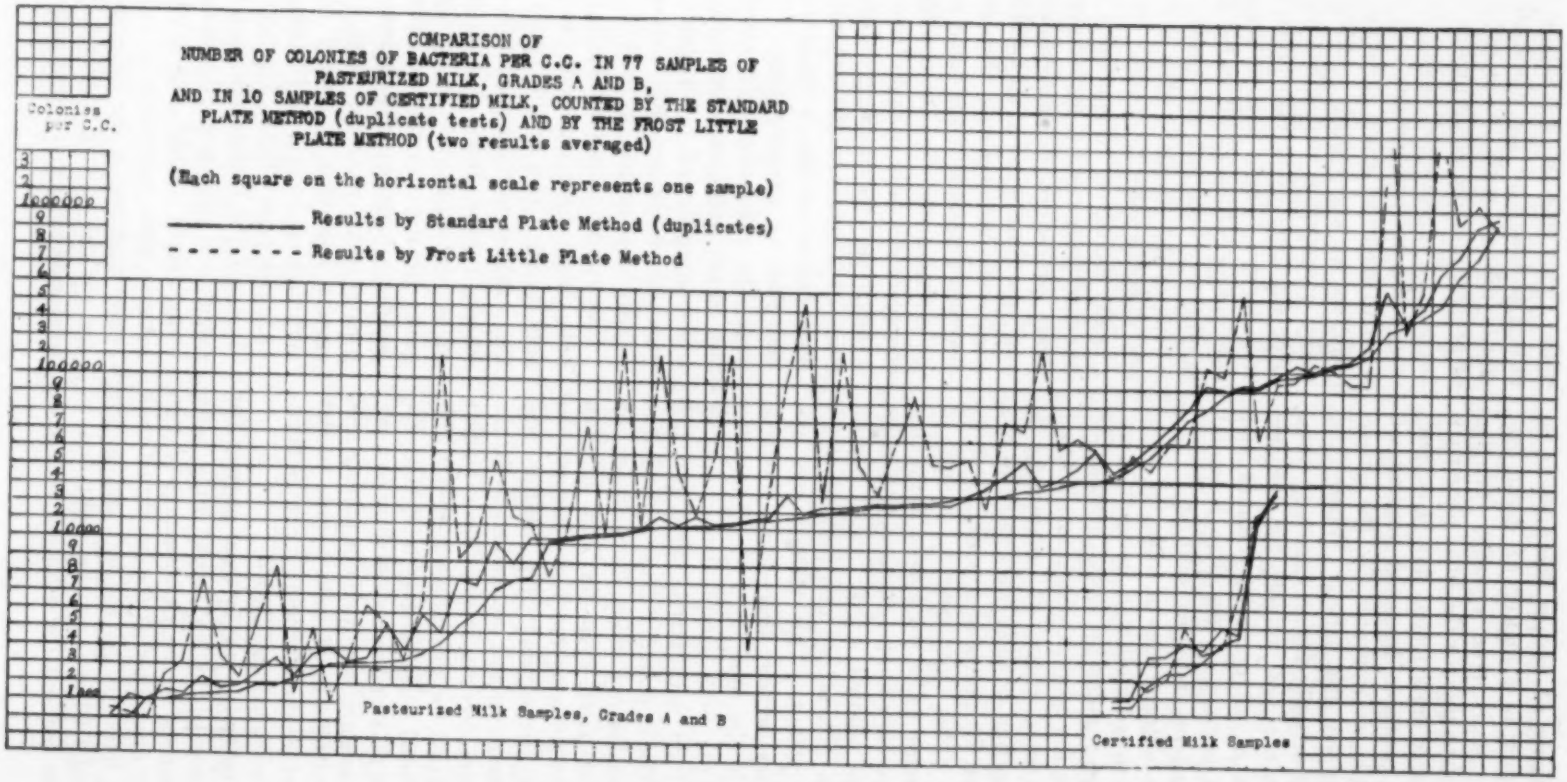

COMPARISON OF
NUMBER OF COLONIES OF BACTERIA PER C.C. IN 77 SAMPLES OF PASTEURIZED MILK, GRADES A AND B,
AND IN 10 SAMPLES OF CERTIFIED MILK, COUNTED BY THE STANDARD PLATE METHOD (duplicate tests) AND BY THE FROST LITTLE PLATE METHOD (two results averaged)
(Each square on the horizontal scale represents one sample)
Results by Standard Plate Method (duplicates)
Results by Frost Little Plate Method
Colonies per C.C.
Pasteurized Milk Samples, Grades A and B
Certified Milk Samples

CHART 1

These percentages are somewhat higher than those obtained from duplicate standard plates made during the course of this study. The duplicate standard plates gave an average variation of 9 per cent on 87 samples of certified and pasteurized milk. These duplicate standard plate counts with the corresponding Frost little plate counts are graphically shown in the accompanying Chart 1.

In Table 4 comparative results by the two methods are given in detail for each grade of milk. These results have been selected from many hundreds of similar results in such way as to convey a fair idea of the usual agreement by the two methods and the degree of occasional disagreement.

It will be seen (Table 4) how rarely the comparative counts fail to coincide in rating the milk above or below standard. In not more than 2.0 per cent of all samples tested would the legal rating have been altered by the method of counting; the milks were either above or below standard by both methods. The exceptions noted were about evenly divided between those cases where only the standard plate gave a count in excess of grade and the cases where only the Frost little plate gave a count in excess of grade.

Summary.—In the hands of properly trained workers the Frost little plate count is probably as accurate and reliable as the standard plate count for routine laboratory work, especially in the case of pasteurized, certified and Grade A raw milks with the rare exception of milks containing large numbers of certain unusual types of bacteria. Where the counts exceed a million, as they often do for Grade B raw milk (the legal limit for which is 1,500,000 per c.c.), a greater discrepancy between the two methods sometimes appears. Even here the rating is seldom affected by the method used, but it is evident that the dilution technic for the Frost little plates must be further modified to take care of very highly contaminated milks and those containing unusual types of bacteria.

TABLE 3

CORRESPONDING AVERAGE COUNTS BY THE STANDARD PLATE METHOD AND THE FROST "LITTLE PLATE" METHOD

Grade of Milk	Legal Maximum Colony Count per c.c.	Number of Samples Included	Average Colony Count per c.c.		Little Plate Variation from Standard Plate
			Standard Plate	Little Plate	
Certified	10,000	22	4,484	4,330	-3.5%
		(24) *	(14,660)*	(16,468)*	(12.4%)*
A. Pasteutized	30,000	15	15,220	18,067	18.7%
B. Pasteurized	100,000	47	83,874	98,757	17.7%
A. Raw	200,000	66	73,403	84,921	15.7%
**B. Raw (country)	300,000	48	1,377,917	984,182	**-28.6%
B. Raw (city)	1,500,000	41	693,793	591,101	-14.8%

*These entries represent the same 22 samples of certified milk shown above plus 2 very high count samples (see Table 2). It can be seen how quickly the average variation by the two methods is altered when excessively high count samples are included.

**More than half of these samples were 48 hours old and the counts on many were too high for exact findings with the present way of making dilutions for the little plate test.

TABLE 4.

Grade of Milk	Legal Maximum per c.c.	Colonies per c. c.	
		Standard Plate	Frost Little Plate
Certified.....	10,000	5,650	8,100
		4,400	4,300
		3,500	2,600
		4,500	3,100
		5,000	5,900
		5,500	4,800
		1,800	3,100
		1,800	3,100
		*141,200	*147,300
		*112,000	*152,600
		1,600	2,000
		1,800	3,000
		900	300
		1,500	1,600
		*12,000	8,800
		*16,500	*18,900
		3,000	2,500
		1,100	4,000
		3,500	2,000
		3,500	1,300
		6,700	7,100
		10,000	5,600
		2,200	1,100
		2,200	1,000
A. Pasteurized.	30,000	*Plate over-crowded	*2,446,400
		4,500	18,900
		12,000	10,900
		9,000	13,900
		3,500	4,800
		2,000	3,300
		*80,000	*93,300
		20,000	19,400
		*38,000	*37,000
		5,200	9,000
		5,000	5,000
		5,000	5,000
		*61,700	*76,600
		13,500	28,900
		3,300	3,000
		7,500	5,000
		8,000	5,000
		2,300	4,000
		*400,000	*144,000
		5,300	6,000
		18,500	24,200
		30,000	*37,900
B. Pasteurized.	100,000	28,000	26,100
		43,000	85,800
		3,900	7,000
B. Pasteurized (Continued)	100,000	*147,000	*133,000
		*182,000	*319,900
		*223,000	*273,000
		88,000	50,600
		41,000	33,300
		80,000	100,000
		44,000	37,200
		*170,000	*159,000
		*120,000	86,700
		24,000	24,000
		*640,000	*773,300
		61,500	70,000
		20,000	27,000
		6,600	8,000
		3,900	7,000
		59,000	44,900
		65,000	26,500
		96,000	19,500
		*260,000	*139,200
		*420,000	*599,900
		43,000	64,900
		*110,000	*129,900
A. Raw.....	200,000	36,000	35,800
		42,000	46,600
		58,000	53,300
		104,000	123,300
		120,000	138,300
		144,000	199,900
		80,500	94,900
		110,000	84,900
		100,000	121,600
		96,000	120,600
B. Raw..... Collected in Country	300,000	240,000	296,600
		92,000	92,000
		*1,800,000	*1,866,400
		*2,300,000	*2,899,700
		250,000	283,300
		*556,000	*783,300
		*556,000	*599,900
		*500,000	*366,600
B. Raw..... Collected in City	1,500,000	160,000	186,600
		630,000	491,600
		140,000	199,900
		42,500	49,900
		560,000	473,200
		*1,550,000	*1,606,500
		240,000	233,300
		*2,650,000	*1,733,100
		*2,200,000	*1,666,500
		155,000	166,600
		940,000	1,116,500

NOTE: Stars indicate counts in excess of legal maximum.

Conclusions.—Our present opinion is that both methods are to be depended upon and that, according to the local conditions, one or the other can be utilized.

Whether this test supplants the standard plate method or not, it is a matter of satisfaction to have a second test that can be run in parallel whenever check tests are made.

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BOTTLED BEVERAGES AND SODA FOUNTAIN SIRUPS

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THE DEVELOPMENT of the non-alcoholic beverage industry in the United States during the past ten or fifteen years has been quite phenomenal. The production of carbonated beverages had indeed assumed a place of distinct importance as an industry prior to the war, but in spite of a heavy, and what the industry considers a burdensome, war time tax the output has steadily increased. This increased demand for non-alcoholic beverages has, of course, been influenced by the legislative prohibition of alcoholic beverages, but the recent development of this industry, in my opinion, is by no means due entirely to this cause, but rather to a recognition by the public of the real merit of the present day non-alcoholic beverages. I have frequently remarked upon the tendency among men, especially young men, in various sections of the United States in cafes, hotel dining rooms, clubs and dining cars, to order non-alcoholic beverages, fruit juices, etc., in preference to alcoholic drinks, and as this tendency was noted in what may be designated as the pre-Volstead Act period, it could be attributed only to preference.

For our present consideration, non-alcoholic beverages may be broadly divided into three classes: namely, bottled sodas, fruit juices, drinks sold at soda fountains and cereal drinks. Non-alcoholic beverages are, in fact, classified under approximately these subdivisions for federal taxation purposes in Treasury Regulation 22, page 11, article 13.

I shall not at this time discuss the cereal beverages, the production of which has assumed very considerable importance, but confine my remarks to bottled

sodas and to soft drinks sold at soda fountains, discussing only incidentally bottled fruit juices.

From the regulatory standpoint of the Federal Food and Drugs Act we are more particularly interested in flavors and flavoring sirups used in bottled sodas and soft drinks sold at soda fountains than in the finished article which is ready for consumption, for the reason that the finished product is not shipped in interstate commerce to any large extent, compared to the total production, and only a small portion is therefore subject to the provisions of the Act.

As indicated above, the people of the United States consume enormous amounts of soft drinks; indeed, it may be said we as a nation have acquired the soda water habit. Millions of dollars in internal revenue taxes are collected annually by the Federal Government from the beverage industry. It has been estimated that the equivalent of over four billion pints of bottled sodas are consumed annually, in addition to the enormous consumption of soft drinks at the soda fountains in the thousands of drug and confectionery stores in the various towns and cities of the country. The increasing demand of the public for delectable thirst-quenching beverages has incited the flavor manufacturers to bring from the four corners of the earth all manner of spices and condiments. Some of these are prized articles of Biblical tradition, while others were then unknown, and perhaps would have remained unknown except for the apparently insatiable appetite of American beverage drinkers. There is probably no other class of food which is subject to such intelligent and scientific manipulation as the flavor industry, most of which is of distinct advantage to both the industry and to the public, but it is very easy for deleterious ingredients to be introduced into such products, without the consumer being aware of the actual or potential danger, and without any means of self-protection. It is important, therefore, if the people in this country are to have any conception of what they may be drinking in such large quantities, and a proper protection against possible harm, that the provisions of the Federal Food and Drugs Act should be applied to such products, and that activities under the Federal Act should be supplemented by adequate state and municipal control..

The ten or twelve thousand bottlers, the proprietors of the thousands of soda fountains, and the housewives who make up flavored beverages for home consumption, usually purchase their flavoring material in the form of concentrates and straight flavoring sirups, emulsions, pastes or alcoholic extracts. The principal difference between the so-called concentrates and straight flavoring sirups is that the concentrates are diluted by the bottler with simple sugar sirup in the ratio of perhaps one part concentrate to twenty parts simple sugar sirup, one fluid ounce of the final mixture being contained in each seven or eight fluid ounces of finished beverage, while the straight flavoring sirups are not diluted with simple sugar sirup, but are used directly in the manufacture of the finished bottled soda. As examples of the concentrates and straight flavoring sirups we have the cola type, the fruit or imitation fruit type, and a miscellaneous type, to the individuals of which distinctive names are generally applied.

The cola type of sirup is distinctive in its nature because of its somewhat peculiar flavor, and because one of the characteristic ingredients is caffeine. In addition to caffeine the cola syrups contain sugar, acid, color and a mixture of flavors of which the dominant ones are frequently lemon and orange, supplemented by many aromatic or pungent substances, some of which would never be suspected by the public, as for instance, Russian oil of tar, which is used

to give a peculiar "tang" to one of our popular American beverages.

The so-called true fruit flavored syrups rarely contain fruit or fruit juice as such, for the reason that the public demand in the past has been for a clear and limpid or cloudy finished article, and must not contain floating organic matter or sediment. In order to meet these preferences on the part of the public, the manufacturers have produced true fruit sirups flavored with either essence or fruit aroma obtained by distillation under reduced pressure of the pulp and juice of fruit. These essences, when added to simple sugar sirup and manufactured into finished beverages, produce articles that are limpid and clear with no sediment, and which are, in fact, true fruit flavored beverages, but do not contain fruit or fruit juice as such, and the labeling of the articles should be of such a character that the consumer can distinguish clearly and definitely between an article made with fruit essence and one that is made with the whole fruit juice. Soft drinks which contain fruit and fruit pulp may be purchased, of course, at the fountain. Such drinks are usually made from crushed fruit, and these beverages are greatly appreciated by the public. The crushed fruit used in these articles is usually obtained by packing whole fruit, such as strawberries, raspberries, etc., in alternate layers with equal weights of sugar. After the sugar has extracted the juice from the fruit, the resulting sirup is drawn off, and the pulp remaining is distributed to soda fountains for making fruit sodas.

A third type of flavoring syrup is that made with root extractives, essential oils obtained from plants, or synthetics which in chemical composition are similar to the characteristic flavoring ingredients of the essental oil or any combination of the above enumerated ingredients. Examples of this type of product are lemon and orange sirups made with lemon and orange extract or terpeneless lemon and terpeneless orange extract, respectively, and used to manufacture orange or lemon sodas, but not lemonade or orangeade; ginger ale made with ginger extract and rendered water soluble; cream sodas flavored essentially with vanillin, the characteristic ingredient, giving flavor to the vanilla bean; root beer and sarsaparilla made with methyl salicylate, the characteristic flavoring ingredient of oil of wintergreen; benzaldehyde, a synthetic chemical which strongly reminds one of cherries, and which can be obtained from the seeds of the bitter almond and from peach kernels.

A fourth type comprises the imitation fruit sirups, for the manufacture of imitation fruit sodas. The sirups of this class and the beverages made from them usually contain, in addition to synthetic fruit flavors, artificial color (usually a coal tar color, or combination of coal tar colors and sometimes a vegetable color), acid (which is usually citric or tartaric or a mixture of the two, or frequently also phosphoric acid), sugar, and water. The finished article, therefore, by its color and by the name of the fruit by which it is known or which appears on the label, looks like a fruit product, and when the bottle is opened it tastes and smells like a fruit product, but is in fact not a fruit product, as it contains no product of fruit except the acid. It is simply an imitation fruit article. Suggestion has much to do with the way the public regards beverages of this type. An instance came to our attention where the proprietor of a soda fountain built up a reputation for selling a particularly high class and desirable orange drink. The appreciative public lined up daily at the counter to obtain the refreshing drink. A food inspector who was curious investigated the manufacture of the article, and found that it consisted of sugar, fruit acid, water and a coal tar color. He observed, however, that when the beverage was served at the counter, a slice of orange was notched and placed on the edge of

the glass, so that in drinking the purchaser's nose came very near the orange peel. No addition to those ingredients given above was necessary to convince the buyer that he was getting a satisfying, real orange fruit drink.

The power of suggestion is taken advantage of, to a considerable extent, by the use of a gum for the artificial production of a "cloud" in bottled sodas. If gum is used in a proper way, an even, uniform turbidity can be produced in a bottled soda, which will simulate the appearance of fruit juice and pulp, with the added advantage that if the emulsion is properly made it will not settle out and produce an objectionable sediment in the bottle. Undoubtedly the use of gums to produce a cloudy drink has in some instances been due to the desire of the manufacturer to take advantage of the interest aroused by the popular discussions of vitamines, and especially of certain fruit juices as a source of one of them. While the simulation of the appearance of fruit pulp may not be the only commercial advantage in the use of gum, since by its use larger quantities of essential oil can be held in suspension in the sirup, yet the simulation of the appearance of fruit is so marked that the Bureau regards this artificial production of "cloud" by the use of gum as resulting in making the article an imitation fruit sirup, even if the flavor of the article is due to natural oils derived from plants, and is not due to the presence of a synthetic flavor.

A fifth type of concentrate or straight flavoring sirup is that of miscellaneous products which are not imitations of, nor offered for sale under the distinctive name of another article, but which are sold under their own names. This type would, of course, include the first type mentioned above, namely, the cola. Such products are known by distinctive names which have no inherent nor definitive meaning, such as possibly "sky-lark," "blue-bird," etc.

In addition to flavoring sirups, emulsions pastes and alcoholic extracts are supplied to bottlers, proprietors of soda fountains and housewives for use in flavoring beverages. Flavoring emulsions are thick viscid mixtures, an important requirement in their manufacture being that they shall not "break" for a considerable period after they are made. The chief ingredients of such flavoring emulsions, besides the flavor itself, are gum, glycerine, and usually water and sugar. Some of these emulsions are manufactured and used in such a way by the manufacturer that they will produce the "cloud" in the bottled soda which has been referred to. The types of emulsions are much the same as the types of concentrates and straight flavoring sirups; in other words, the emulsions may be made from fruit juice, true fruit essences, root extractives, essential oils, synthetic chemicals, or from combinations of these ingredients.

Pastes are preparations of much the same nature as the emulsions, except that they are more viscid, and are of the same types and used for the same purposes as the emulsions and flavoring sirups. The alcoholic extracts for bottlers' use, or flavors as they are called, have one characteristic which differentiates them from the flavoring extracts for food purposes; that is, the flavoring material held in solution by the alcohol must produce a clear, limpid beverage when it is added to simple sugar sirup and diluted with water to make the finished article. Bottlers' flavors of this kind are made mostly from essential oils, from synthetic chemicals which are similar in composition to the chief flavoring ingredient of a particular essential oil, from fruit essences, from imitation flavors and from all possible combinations of the ingredients named. It is not necessary to enumerate the different types of flavors, as most of them are familiar. As stated above, an important requirement of these articles is that they be water soluble.

Having considered the types and the labeling of articles of this nature, it is of interest to consider the ingredients of these products from the standpoint of health. From this viewpoint I shall discuss the following ingredients: those derived from plants and fruits, such as spices, essential oils and fruit juice; artificial color, certified and uncertified; vegetable colors; the so-called fruit acids, phosphoric and other mineral acids; caffein; preservatives, permitted and forbidden; gums; synthetics; saponins; saccharin and sugar substitutes.

Some of the spices and essential oils which are common ingredients of the four classes of products which we are considering are as follows: oils of almond, anise, calamus, caraway, cardamon, cassia, celery, chamomile, cinnamon, cloves, coreander, cumin, fennel, ginger, lemon, lime, mace, neroli, nutmeg, orange, orris root, peppermint, allspice, rose, sassafras, spearmint, and sweet birch. I know of but very little work that has been done to determine the physiological action or effect of these materials when consumed in small quantities. Some of the spices are known to be antiseptic. While they are present in very minute quantities in the finished sodas, it is possible, however, that some of them may be detrimental to health.

Of the acids used in flavoring sirups, citric and tartaric usually referred to in the trade as the fruit acids, are the most important. It is possible that malic acid will be produced commercially in quantity in the near future and will compete with citric and tartaric acids for use in beverages. In certain types of beverages, such as the phosphates, phosphoric acid is, and should be, used. Other mineral acids, sulphuric acid, hydrochloric, and mixtures of these with phosphoric, are also employed to some extent. The Bureau does not encourage the use of mineral acids, such as sulphuric and hydrochloric in food.

Caffein is an important constituent of the cola type of beverages, just as it is an important constituent of coffee and of tea. A beverage containing caffein in sufficient amounts to cause injury to health would be considered adulterated, though the Bureau has made no announcement regarding the amount of caffein which would be considered harmful.

The Bureau has examined periodically beverages of this type which are shipped in interstate commerce, and so far as we are aware, caffein is not present in any of them in an amount exceeding 1 grain of caffein per fluid ounce of sirup, that is, 1 grain of caffein per seven fluid ounce bottle of finished beverage, since ordinarily the bottler uses 1 fluid ounce of sirup to each small bottle of soda. As much as 1 grain of caffein per fluid ounce of flavoring sirup is the exception, the average of 31 samples examined recently in the Bureau being about .2 grain. A cup of coffee contains from 1 to 2 grains of caffein according to the character of the beans used and method of preparation.

The use of preservatives in food, and especially in that class of food under consideration, is a most important question and worthy of more discussion than can possibly be given to it at this time. So long as the sirup manufacturer or bottler limits his raw materials to essential oils, imitation flavors and pure sugar, he has little need for a preservative, since, with reasonable cleanliness about the plant there is but little danger of sirups fermenting and souring. When, however, the bottler uses fruit or fruit juice in his sirups, or employs a substitute for pure cane or beet sugar, such as corn sugar, maltose, etc., he may encounter difficulties unless he takes more than ordinary, and sometimes expensive precautions, or uses a preservative. Those responsible for the policies of the Bureau have never encouraged the use of pre-

Preliminary investigations of the toxicity of caffein have been made, the results of which are set forth in Bureau of Chemistry Bulletins Nos. 148, 157 and 166.

servatives in food, although it is appreciated that under some conditions and with some products, especially those products the taste or flavor of which is impaired by the application of even as low a temperature as is used in pasteurization, it may be necessary to employ a preservative. Sulphur dioxide and benzoate of soda are permitted in food under certain conditions, which are set forth in Food Inspection Decisions 89 and 104. Sulphur dioxide may be used in ordinary quantities if its presence is declared on the label, and benzoate of soda may be used provided both the presence and the amount of this preservative are declared upon the label.

As has been indicated above, gums, such as gum arabic, gum tragacanth, Indian gum and other gums are coming into quite extended use in the manufacture of flavoring emulsions. The Bureau believes that where gums are used in food articles of this kind, although they are not considered to be specifically harmful, their presence should be declared upon the label, because of their indigestible character and because the public does not expect them to be present in soft drinks. Gums are present in emulsions in widely varying proportions, from 1 per cent or less to perhaps 15 per cent or more.

Under the subject of synthetics is included a long list of chemicals which are used singly or in combination in the production of artificial and imitation flavors. These synthetics may be divided into two classes: those which are chemically identical with the principal flavoring constituent of plants or parts of plants and their essential oils, and those which are either found in plants in very minute quantities or which have not been isolated from plants.

Some of the chemicals belonging to the former class are benzaldehyde (a coal tar product which is the principal flavoring constituent of oil of bitter almonds and oil of peach kernels); coumarin, the chief flavoring ingredient of the tonka-bean; vanillin, the chief flavoring principle of the vanilla bean; methyl salicylate, the principal flavoring ingredient of oil of wintergreen; and cinnamic aldehyde, which is present in cinnamon bark oil.

The following are some of the synthetic chemicals which either are not found in nature or do not exist naturally to a sufficient extent to warrant obtaining them from natural products: the ethyl, methyl, propyl, isopropyl, butyl, isobutyl, amyl, isoamyl, etc., esters of formic, acetic, propionic, butyric, valeric, isovaleric, salicylic anthranilic, etc., acids; also the higher alcohols, aldehydes, ketones, and certain phenols, etc. In fact, the manufacturer of flavors now draws upon those synthetic chemicals formerly used almost exclusively in perfumes, and does not limit himself to the so-called banana oil, etc., which his predecessors of a few years ago employed in the manufacture of imitation flavors. In many instances the flavor of essential oils is rounded out by complex synthetic chemicals, so that the product has a fruity odor which the essential oil itself may not possess. Very little work has been done with the view of determining whether or not these synthetic chemicals are harmful. The toxicity of the alcohols, methyl, ethyl, propyl, butyl and amyl has been investigated by Picaud, Baer, Efron, Dold, Macht and others, but generally speaking, the toxicity of imitation flavors has received but scant attention. Work along this line is being conducted by the Bureau. It must be borne in mind that, as in the case of preservatives, the actual amount of these synthetics which is contained in one or even several glasses of soda is exceedingly small. Some of these, however, are so potent that a drop or two in a gallon of water will impart a strong flavor to the liquid. Moreover, these imitation flavors are frequently employed to fortify or round out essences from fruit, essential oils and fruit juices, in which case

even smaller quantities of the synthetic flavors are in the finished product.

Saponin is the material used by bottlers to produce a foam or bead on the beverage. It is quite largely employed in some ginger ales, sarsaparillas and imitation fruit beverages. Some of the saponins are toxic, and saponin made from quillaja bark is considered to be especially undesirable for use in food. France prohibits the use of saponin in food, and the laws or regulations of some of our states restrict its use. The Bureau regards soft drinks as adulterated if damage or inferiority is concealed by the use of saponin, or if the particular saponin which is used is harmful or deleterious.

There is no objection to the use of harmless and nutritious sugar substitutes, such as glucose, maltose sugar, and similar products. In fact, the Bureau encouraged the use of these wholesome food articles during the sugar shortage. It is considered, however, that the people ordinarily expect their sweet food to contain sugar, and in order that the public may not be misled, it is required that when glucose and similar sugar substitutes are used in flavoring sirups, their presence must be declared upon the label if such articles are shipped within the jurisdiction of the Act.

It has been our experience that the regulatory control of food, including flavoring sirups, through the administration of the Federal Food and Drugs Act, has resulted in raising the standards of many products. Of course, raising the standard of an article sometimes means increasing the expense of manufacture, which must ultimately be borne by the consumer. Furthermore, as the quality and price of an article are raised, a greater opportunity is offered for "fly by night" concerns to manufacture and sell inferior and adulterated articles. However, when everything is considered, it is believed that the majority of manufacturers, themselves, would not consider for a moment the repeal of such an Act as the Federal Food and Drugs Act, which is of such protection to the public, and also to the manufacturers against unfair competition. The administration of the Act, however, must be assisted by interested and sympathetic public opinion and the appreciation of conscientious manufacturers, since otherwise it cannot accomplish the great good in protecting the public health which the men who created the law contemplated.

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The Medical Department of the United States Army in the World War, Vol. XV, Statistics; Part I, Army Anthropology. *Prepared under direction of Surgeon General M. W. Ireland by Major Charles B. Davenport and Major Albert G. Love. Washington, Government Printing Office,* 1921. 635 *p.*

This report supplements the exhaustive study of *Defects Found in Drafted Men,* by the same authors. It is based on three standard physical measurements, height, weight and chest circumference, taken on 1,000,000 recruits at the time of entering military training, with special reference to the distribution of physical defects in the Army, taken on 2,000,000 recruits, and on a series of 17 other anthropological measurements taken on 100,000 troops at demobilization. The whole study gives an insight into the sizes and proportions of the American male population, ages 21 to 30 years, with reference to various conditions of health, build, robustness, geographical distribution, occupational environment, density of population, race and color.

The comparisons with the Civil War measurements of Gould and Baxter are of interest, and the relations of certain measures to various diseases and defects will be illuminating to the sanitarian. For instance, tall men are especially prone to varicose veins, varicocele, pulmonary tuberculosis, cardiac disorders (both functional and organic), and goiter (both simple and exophthalmic). A very high proportion of men with low stature were found with defective teeth and refractive errors of the eye.

The work is that of trained anthropologists and statisticians, and while technical, is clearly and graphically presented.

THE WORK OF THE AMERICAN BAKERS ASSOCIATION IN THE DEVELOPMENT OF A SANITARY CODE FOR THE BAKING INDUSTRY

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Read before the Food and Drugs Section of the American Public Health Association at the Fiftieth Annual Meeting, New York City, November 18, 1921.

THE control of the food supply has long been a governmental function. For some thousands of years, laws and regulations have been in force, and inspectors at work protecting the consumer against fraud and injury to health.

Under the conditions created by rigid food laws, adulterations by the use of inferior substitutes, injurious colors and preservatives, and all the fraudulent practices which have harassed trade and worried the consumer, have become, for the most part, a thing of the past. Food control has entered a new phase—that of the rigid sanitary supervision of the manufacture and distribution of food products.

As we recall how recently this work has been developed, it is somewhat mortifying to remember that Moses laid down splendid sanitary laws for the Children of Israel 3400 years ago, and that long before the Christian era Athens and Rome had market and meat inspectors. Although we have been a long time establishing these very desirable sanitary regulations, it is gratifying to know that at the present time almost every state in the Union has a sanitary food law on its statute books; that every large city has a comprehensive sanitary code, and that the duties of the sanitary inspector as an agent of the health department are recognized by the consumer as an important and necessary function.

Within the last few years the food industries have come to appreciate the importance and value of sanitation. It is still not unusual to hear the remark, "If you saw it made you would never want to eat it again"; but modern food factories are being constructed and run on the theory, "If you see it made you will buy a case." These comments, with such opposite conclusions, represent well the changes which have taken place in food manufacture since it came to be understood that visible dirt is not the most dangerous, and that the invisible molds and bacteria are evidences of uncleanliness that if allowed to develop will turn good raw material into garbage and carry poison instead of food to the consumer.

No industry depends so fully upon the good will of the consumer as the baking industry. Women have not yet lost the art of baking. Bread can still be made in the home, but it is rapidly becoming a factory product because the housewife has learned that she can buy a better product than she can make, and buy it more cheaply than she can produce it in her own oven. So long as flour can be purchased in small quantities at the grocery store and readily converted into desirable food in the home, the baker will be forced to make quality products. As a matter of fact, the baking industry has reached the point where force and coercion are quite unnecessary arguments toward the production of desirable bread. Indeed within the last few years the baker has stepped out into the limelight and has come to the front as an idealistic food manufacturer. He has fortified his industry by providing it with laboratories devoted to research and service; he is establishing schools for the instruction of the men who will be the bakers of the future, and now he is proposing to operate his industry under sanitary and ethical codes which he has designed for

the purpose of making federal, state and municipal regulations unnecessary in so far as they are applied to this industry. This will go far toward eliminating from the ranks of the bakers men whose moral status unfits them for playing any part in the production and handling of our most important food.

At the last convention of the American Bakers Association a new constitution was unanimously adopted. The purposes of the Association were set out in part as follows:

Section 1. The development of the baking industry by increasing the use of commercially baked products.

(a) By securing wider application by bakers of improved methods and advanced baking practice.

(b) By education within the industry, to raise the standard of sanitation and trade practices, and to promote the use of wholesome ingredients and the production of products possessing the greatest possible food values.

(c) By encouraging proper, and discouraging improper legislation, and obtaining representation for the industry in all matters before federal and state bodies and consumers.

(d) By promoting intelligent understanding on the part of the public in relation to the operating methods and practices of the trade.

Applicants for membership must qualify under rigid membership standards and agree to conform to and maintain the standards. The membership standards require a suitably kept and located plant, adequate bakery equipment, intelligent operating methods, careful attention to the health of employees and compliance with a code of ethics which is far-reaching in its scope, and unique in the definiteness in which it sets out the relationship between the industry and the consumer.

One of the purposes of the Association is the certification of member bakeries, and the requirements prior to certification are explicit. They read as follows:

LOCATION AND CONSTRUCTION OF PLANT

1. Every bakery shall conform to the requirements of the sanitary codes or other statutory provisions and regulations of the state, county and city in which it is situated, with respect to its location and construction, bakery equipment, operating methods, and health of employees.

2. Every bakery shall, in any event, conform to the following specific requirements which this Association deems essential:

(a) The bakery shall be so located that drainage to sewers is adequate and that the basement and floors are not subject to recurring or foreseeable flooding.

(b) It shall not be located adjacent to conditions or industries which are inimical to the production of wholesome bread.

(c) It shall have convenient toilet rooms, separate and apart from the room or rooms where the materials and doughs are kept and prepared, or where baked products are stored or handled.

(d) Adequate and convenient wash rooms and toilet rooms shall be provided with soap, running water, and clean towels, maintained in a sanitary condition.

(e) Rooms shall also be provided for changing and hanging wearing apparel, separate and apart from the production, storage and sales rooms.

(f) The bakery shall be properly protected from flies.

(g) The bakery shall have suitable equipment for handling raw materials, doughs and finished products in a cleanly and sanitary manner.

(h) There shall be sufficient ventilation and light provided to insure the health of the employees and the wholesomeness of the bakery products, free from excessive heat, fumes dust and other conditions inimical to such health or wholesomeness.

OPERATING METHODS

(i) The floors, walls and ceilings of every bakery, the equipment used in the preparation or handling of bakery products, or their ingredients, and the vehicles, boxes, baskets and other receptacles in which bakery products are stored, handled or transported, shall be kept in a clean and sanitary condition, free from all contaminating matter.

(j) All bakery products and their ingredients shall be stored, handled, transported and kept in such a manner as to protect them from spoilage, contamination and unwholesomeness.

(k) All workmen and employees, while engaged in the manufacture of bakery products, shall be clothed with external garments of washable material which shall be used for that purpose only, and these garments shall be kept clean.

(l) The smoking, snuffing and chewing of tobacco shall be prohibited in the rooms of the bakery where the materials and doughs are kept and prepared, or where the baked products are stored or handled.

(m) No animals or fowls shall be kept in or permitted to enter the bakery rooms where the materials and doughs are kept and prepared or where the baked products are stored or handled.

HEALTH OF EMPLOYEES

(n) No person affected with any contagious, infectious or other disease, or physical ailment, which may render such employment detrimental to the public health, shall work in a bakery or handle any of the products therein or delivered therefrom. Freedom of bakery employees from any such diseases shall be evidenced by a certificate of medical examination, such examination to be made at least annually.

(o) No person who has had typhoid fever shall be employed in any bakery until adequate clinical examination has proven the applicant free from typhoid bacilli.

The Code of Ethics reads in part as follows:

1. I recognize my duty to the American home to be to make my product of highest food value at lowest cost.

2. I believe that the rendering of honest and efficient service on the part of my employees deserves fair consideration and that they should receive a fair return for their labor and be enabled to enjoy healthful surroundings, both physically and morally. I recognize a man's inherent right to work with freedom of conviction, without prejudice, and I will expect only an honest day's work and thoughtful consideration of our mutual interests and obligations.

* * * *

5. I will use no materials or ingredients other than those of known purity and wholesomeness in the manufacture of my products.

6. I will at all times adhere rigidly to the truth in all my advertising.

7. I will keep my plant and premises at all times as clean and sanitary as is humanly possible, and welcome public inspection at all times. I shall expect of my employees what the public has a right to expect of me, that we keep ourselves morally and physically clean.

This is an ambitious program. It cannot be carried through successfully without the coöperation not only of consumers, but of all health and food officials. The health officer should be especially concerned in the new movement in the interest of better baking practices and the production of bread of assured wholesomeness. It is not a usual thing for industries to police themselves, and yet this is just what the baker proposes to do. That it may know that every member is conforming to the rigid requirements of the sanitary and ethical code, the Association proposes to set up an inspection service and to maintain a corps of trained inspectors whose duty it will be to supervise the manufacturing methods of its members.

Obviously it is not practical to place an inspector in every bakery. Indeed, it should not be necessary, for we have already at work some thousands of sanitary officers who should welcome this new project of the baking industry and work with it for the purpose of seeing that its high ideals are fully complied with. Is there any reason why the Association, through the American Institute of Baking, its scientific branch, and through its committee on sanitation and ethics, should not set up a partnership of effort between its inspectors and the departments charged with enforcing sanitary laws? Can they not work to their mutual advantage and always to the more complete protection of the consumer?

If there be any flaw in the plan it is the fact that the Association does not include all the bakers of the country. There are more than 30,000 bakers, or rather it should be said there are more than 30,000 places where bread is made. The number of bakers—that is, trained, conscientious, well-equipped public servants—is far less than this. Fortunately the industry is rapidly eliminating basement shops, insanitary plants, the ill-kept, carelessly operated, unwholesome places which still too commonly fix the public idea of the conditions under which bakers' bread is made.

At least half of the entire bread production of the country, outside of the supply baked in the home, comes from the sanitary plants of Association members. May we not hope that by the adoption and enforcement of a sanitary code a far larger proportion of the bread supply will eventually come from certified plants?

REASONS FOR THE FAILURE OF OUR METHODS TO CONTROL DIPHTHERIA

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I HAVE no apologies to make for writing on a subject that has been so well covered by papers that have appeared recently. The very fact that so much has been written on the subject proves the necessity of paying much attention to it and that better methods of control are desirable. I hope to prove that quarantine is of no value in the control of diphtheria and only leads to a feeling of security that is false, for it is indeed a sad state of affairs that neither the morbidity nor mortality of diphtheria has declined to any great extent during the last ten years. Figures given by Weaver,[1] Carey,[2] Hull,[3] and others, prove this. What are the reasons for this continued high morbidity and mortality? The answer is the same for both morbidity and mortality, except, as I hope to prove, that missed cases are the greatest factor of all in continuing the high morbidity, while failure of early diagnosis is the greatest single factor in maintaining the high mortality. The responsibility falls alike on the public and physicians.

Failure to make an early diagnosis is due to several causes. First, parents of children, or adults who are sick often fail to call a physician until much valuable time has elapsed, or the physician himself loses valuable time before making the diagnosis. Far too often the physician waits until he can obtain a report from a laboratory before giving any antitoxin and, as has been repeatedly pointed out, the dosage is frequently too small. In unincorporated districts of Los Angeles County during 1920, the mortality rate from diphtheria was approximately 8.3 per 100,000 population. With the exception of three deaths which occurred 24, 36 and 48 hours, respectively, after onset, in every other death there was a delay of from 48 hours to one week after the onset before any antitoxin was administered, or else no antitoxin at all was used.

As Weaver says, that the time of onset is often stated in case histories to be much later than is actually the fact, due to desire of the parents to avoid the appearance of having neglected the child. It is obvious that failure to establish an early diagnosis is a factor in producing a high morbidity, as quarantine measures are not then instituted until a large number of contacts have occurred, and it is not always possible for the health department to learn the names of, or to investigate all the contacts. Starting with contact from a carrier or another missed case, a child or an adult has a slight sore throat. The symptoms may be so slight as not to keep him from school or from work, or he may stay home for a few days. Frequently a physician is not called or, if he is called, does not consider it diphtheria and does not take a culture. As a result, no control measures at all are taken and the child returns to school at a time when enormous numbers of bacilli in a state of high virulency are present and are being expelled from the nose and throat. I will cite a few instances among a number I have encountered which could doubtless be easily duplicated by other health officers. Of course, laws and court decisions vary considerably in different states, causing marked differences at times in the action that a health department may take. This will explain why our action may seem inadequate to some in certain instances.

A child living in a strictly rural district visited one of the beach resorts one Saturday. The following Tuesday she had a sore throat and stayed at home for two days, after which she returned to school. No physician saw the case. In a few days after her return to school several cases of diphtheria developed

among the school children in the room she attended. These cases were the first, and except for this outbreak, the only ones in that school during that year. There were about 200 children attending the school. A younger sister of the child having the first sore throat developed diphtheria about the time of the other cases and died. A culture from the throat of the first case was strongly positive for diphtheria bacilli, and remained so for several weeks. And six weeks after the initial attack the child was compelled to stay in bed for some time on account of cardiac weakness. Much to the disappointment of a certain class of people, she never had any antitoxin to blame for the cardiac involvement. It is interesting that in the fatal case in this family the mother refused the use of antitoxin on religious grounds, but requested that it be used on two other children who later developed symptoms. A number of cases developed in the school in a few days following the first cases. The trustees became alarmed and closed the school. I persuaded them to reopen, and cultured all the children and teachers. A few carriers found were excluded until they cleared up, and no further cases occurred that year.

In contrast to this is the following: A girl living in another rural district visited a large city. In a few days she developed a sore throat and fever. A physician was called and, considering it only a case of tonsilitis, did not take a culture and made no more visits, as the mildness of the case did not seem to warrant it. I know that the physician is above the average in the care he exercises in cases of a possible communicable nature. I learned of the case, and not knowing a physician had been called the day before, I visited it. There was nothing in the appearance of the throat to suggest diphtheria but, as a matter of routine, I took a culture which was strongly positive and remained so for three weeks. The child showed considerable cardiac weakness, which kept her in bed for most of the period of quarantine and called for much caution for several weeks more. No antitoxin had been given in this case either. No secondary cases occurred, as fortunately there were no contacts outside of the family.

Another case is of interest: A 12-year-old boy living in a fair-sized city, but outside of the corporate limits, died. The family belonged to a religious cult opposed to medicine. A physician was not called until it seemed certain that death would ensue, and he diagnosed the case as one of unmistakable diphtheria. The family said: "We cannot imagine where he got it, as he had been nowhere except school and a few other places." I said to them: "Suppose your boy had had just enough resistance to have had a severe attack and yet not have died. After recovery, but while yet in a stage when large numbers of virulent bacilli were present in the throat to be coughed out, or be deposited on drinking fountains or other places, the boy would have returned to school or in other ways have mingled with other children. The probabilities are that some of these children are susceptible to diphtheria and would have developed the disease. And possibly there would have been a death in some other home. That is just what some other child has done, either consciously or unconsciously, and the death was in your home in this instance." This case well illustrates how great is the need of education of the people to coöperate with officials in reducing morbidity of contagious diseases.

These are just a few of many cases that have come to the notice of this Department, and illustrate so well how the morbidity continues. For if we discover certain cases by accident, how many are there that the best functioning health department must miss? Even if a child is examined before returning to school after an illness, what can be done in case of a child under school age, or an adult who

has a non-fatal, unrecognized case of diphtheria? This child or adult will mingle with others after clinical recovery and while still carrying bacilli of virulent strains; and children in the same family as these unrecognized cases are often carriers when the bacilli are numerous and of an actively virulent strain, and may attend school and visit other places.

Much attention is paid to schools, and yet many other places that are outside of any direct control by health departments are of almost as much importance as potential sources of contagion. I refer to common carriers, soda fountains, movies, dance-halls, Sunday schools, day nurseries, and the crowds that are so often present in department stores. Considering all the facts, it is surprising that the morbidity is not much greater than it is.

There are just two reasons to explain why it is not greater: First, transmission requires a close contact, such as actually coughing in the face while someone is inhaling, drinking out of a cup soon after a carrier has used it, or using some other equally good method to transmit the infection. Second, that the percentage of people of any age group who are susceptible, is much less than tests by the Schick test would indicate. The number of secondary cases in families and institutions verifies this statement. There is usually more or less contact in either class of places before a diagnosis is made and precautions are taken. And in private homes, unless the case is removed to a hospital, it is exceptional that isolation of the case is carried out until negative cultures are obtained. And yet, what per cent of the other children contract clinical diphtheria? It is very much less than the percentage of susceptibles as determined by the Schick test would lead us to believe. It is difficult to furnish exact figures, as isolation of some cases has been complete, and in others the contacts have each received a prophylactic dose of antitoxin. It is true that occasionally one will carry bacilli for some time and then develop a clinical case, but such cases are uncommon. In this connection one must bear in mind that unless the symptoms are typical of diphtheria they may be due to other causes.

A point to which others have drawn attention[5] is the occasional absence of a membrane, and other typical symptoms mentioned in text-books. Occasionally one sees a case of sore throat and fever from which a positive culture of diphtheria bacilli is obtained, and yet no benefit is derived from the use of antitoxin. These cases may well be some of those who are carriers that are always found if cultures are taken, and become sick with tonsilitis or other throat trouble. I cannot agree with Craig's[6] statement that all these cases that give a history of previous sore throat and give positive cultures of diphtheria bacilli, have been cases of diphtheria, for it is illogical to assume that even if one is a carrier of diphtheria bacilli he may not have had a sore throat due to streptococci or other infection, just as other people who are not carriers do, and, moreover, it cannot always be proved that he did not become a carrier because of the greater susceptibility of the tissues to harbor diphtheria bacilli following some other infection.

During an acute attack it might be possible to make an accurate diagnosis between a clinical case of diphtheria and a case of sore throat from other causes in which diphtheria bacilli are found, but are not the cause of the pathology by the degree and character of a leucocytosis. But at a later date it might be impossible to determine the exact status of the case. This statement is corroborated by Park.[7] Of course, in these cases the therapeutic indications are clear even if a strictly accurate estimate of the true diagnosis is impossible. In a true epidemic where practically all are exposed, nowhere near the percentage of persons develop diphtheria that the Schick test would lead us

to believe are susceptible. I believe that the true figure for the number that are susceptible in any one year is the number that develop clinical cases, as under present conditions practically all are exposed to the infection some time or another. Of course this does not apply to the small percentage at home who never leave their own premises, or to very isolated rural districts, or to those in institutions where many precautions can be taken. It seems from practical experience, as determined from statistics given by various writers and from analysis of conditions existing at present, and which probably will exist until a far future date, that the morbidity rate of diphtheria will remain practically the same.

I wish to be clearly understood in making this assertion, that I recognize fully the value of active immunization and am heartily in favor of it. The brilliant work that has been done by Zingher[8] and others deserves much praise. But it will necessarily be some time before an appreciable percentage of people take advantage of it. We can hardly expect that more will voluntarily wish immunization than wish smallpox vaccination, and if California is an index of the whole country, the percentage is less than 20.

The majority of people are prone to be content with the false security of quarantining cases of diphtheria. All that can be done is to offer the protection to those who wish it and let others incur the possibility of contracting diphtheria if they so choose. For is it not more logical to let the people themselves choose whether they wish certain protection, than to force it on them? This plan may not lessen the morbidity statistics of certain health departments, but it allows the public to carry some of the responsibility in limiting communicable diseases. At the same time, it is clearly our duty to carry on continual educational propaganda and to demonstrate the value of protective measures. Let these measures be so valuable that they will stand any investigation and be commended by the great American jury, the public. The people will always chafe under a measure which is forced on them by law, while if it be adopted of their own free will, it is bound to be popular. If it were possible to locate all or nearly all the foci of infection, then it would be possible to eradicate the disease or at least reduce the morbidity rate materially.

From my observation, it seems almost useless to attempt to limit the number of cases. What we gain one year is liable to be more than lost another one. Suppose we were to have a group of people living on an island or some other place where complete isolation of them could be maintained, and suppose we could eradicate diphtheria entirely for a whole generation, and that then in some way the disease should be reintroduced and many be exposed before control measures could be put in force. What would be the result? My prediction is that it would find such a large percentage of extremely susceptible people that the morbidity and mortality rate would be enormous. This, of course, is analogous to cases where a new disease has been introduced among some uncivilized race or tribe. I can offer similar examples in a very minor way. In a few of our districts which are either on the edge of a large city or situated where there is much traffic and intermingling of people, there are nearly always a few houses decorated by a green placard reading "Diphtheria." But in proportion to the number of people the number of cases is not great. In other words, these districts do not have any more cases of diphtheria, figured according to 100,000 population for a 10-year period, than do other districts. On the other hand, in a district that is fairly well isolated there may not be a case of diphtheria for months or even years. But, should a case appear and not be recognized early, before a number of contacts have occurred, the number of cases is large. The number per hundred thousand for a 10-year period is practically the same as in the districts of denser

population, but the number during a short period of time is all out of proportion. Or, to state it in another way, in some districts the wave is low, but continuous, and in other districts the incidence runs in high waves interspersed for varying lengths of time by no cases.

But the great difficulty in reducing the morbidity rate does not excuse us in the least for not reducing the mortality rate. It is an appalling indictment of our intelligence and civilization that more progress has not been made. And how are we to remedy the conditions? *By education.* Education of physicians, the public in general, and all agencies which might be in a position to further the work. The best place to start with this education or program is in the medical school. While there has been some improvement in this respect, in many schools it is regrettable that more progress has not been made. As I have pointed out before,[9] too little importance is attached to communicable diseases in the medical school, and too few of the graduates, even those serving an internship, unless it be in a country or municipal hospital, have any demonstrations worthy of the name on this class of diseases.

What a shame it is when we consider the importance of these diseases from every standpoint — the time lost from school, the deaths, and the complications resulting from them, not to say anything about the effect it has on the physician's standing. So many complications resulting from these diseases could have been avoided had better diagnoses been made which would have enabled precautions to have been taken. Any aurist or urologist or orthopedic surgeon will corroborate this statement. So many cases are atypical that text-books cannot take the place of actual demonstrations. At the same time that we are teaching students to make a diagnosis, the importance of a correct early diagnosis must also be brought home to many of the older physicians. Equally important, also, it is to educate the public to a realization of the serious results ensuing from a deceptive and treacherous disease like diphtheria.

In diphtheria, as Craig[6] has mentioned, the membrane, on which so much stress is laid, is often absent. Hogan[5] has pointed out difficulties in diagnosing the laryngeal type. And then, too, we have nasal types that may be very obscure. Occasionally a culture may be misleading, as the actual location of the region may not be reached by the swab. And, of course, the possibility of a mistake in the laboratory technic must not be overlooked.

To summarize the points to be remembered, in order to diagnose early as many cases as possible and to reduce the mortality rate, we must: First, culture all cases that might be diphtheria and reculture if a negative result is obtained. But of all things, do not let a negative culture prevent antitoxin from being given early if clinical symptoms lead one to believe that the case is one of diphtheria. Second, remember the absence of a membrane in certain cases. Third, remember the possibilities of a nasal or a laryngeal type. Fourth, ask for the coöperation of the health department or of others especially trained in establishing a diagnosis in all doubtful cases. Many cases require rare judgment that is only obtained through large experience. And in asking for consultation, ask for it at a time early enough that treatment may be of value.

While every one who has had an extensive experience agrees about the value of antitoxin as a curative agent and is in favor of active immunization, I wish to enter a protest against the routine use of antitoxin as a prophylactic. Of course, one has to use his judgment in individual cases. Very few of the deaths are from secondary cases in the same family, as all are on their guard and early action is taken when a secondary case develops.

As only a certain percentage of any age group is susceptible, antitoxin is given to the majority needlessly; that is, unless a Schick test is made, and by the time that can be carried out it would be too late to use antitoxin as a prophylactic. Unless it is carefully explained to those immunized that the protection is of short duration, it may cause them to have a feeling of false security at a future date, and so throw them off their guard as to overlook a diagnosis with a possible fatality as the result. While the danger of anaphylaxis is so small as to be negligible, this does not hold true if it is necessary at a later date to use antitetanic or some other serum when the people may forget to tell the physician or he may not ask them of the use of the diphtheria antitoxin previously. The use of a prophylactic dose does not necessarily prevent them from becoming carriers, and it is always a disappointment to the people and disagreeable to the quarantine officers under those conditions to have to extend the quarantine period after the clinical case has cleared up or been removed to a hospital. As carried out at present, our quarantine laws and rules on diphtheria often carry a severe penalty to those who report mild cases to the health department. It occasionally happens that a whole family is held in quarantine for a long period while waiting for negative cultures. This causes many to do all they can to avoid reporting a case, and thus automatically tends to defeat the very purpose quarantine is established for. If our morbidity statistics proved that quarantine produces the results hoped for, I would not enter one protest against it. But the statistics of cities with efficient health departments prove how utterly quarantine has failed to reduce the morbidity and mortality rate. In fact, it creates a feeling of false security in a neighborhood and is nothing more in the case of diphtheria than a method of control inherited from the earliest times when efforts were first made to control the spread of contagious diseases. This criticism necessarily does not apply to certain infections, such as bubonic plague, which may be stopped before they become universal. So let us discard methods which have been tried and found wanting, and exert more energy toward other methods which promise better results. I would suggest, however, a quarantine for a limited time in diphtheria cases, to enable the health department to investigate the cases and permit of isolation of patients while the infection is the most active. This would also permit health departments to prevent the entrance of the disease into institutions or districts where it is now possible to keep diphtheria free. Preach the gospel of sanitary measures, such as avoiding the common drinking cup. Demonstrate and facilitate the active immunization to lessen morbidity. But above all, exert every energy to promote education that early diagnosis may be made and proper treatment instituted early to lower the mortality rate. When this lesson can be brought home to every person, then our mortality rate will reach the point that is the goal of every one of us who has had occasion to observe deaths from a disease that we know so well can be treated with good results if only valuable time has not been lost.

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REPORT OF THE COMMITTEE ON STANDARD PREPARATION OF DIPHTHERIA ANTITOXIN

Approved by the Laboratory Section, American Public Health Association, 1921

YOUR Committee on Standard Methods for Preparation of Diphtheria Antitoxin has attempted to complete a report, but regrets to state that but little progress seems to have been made during the four years that have elapsed since the last report was presented. Several workers besides the members of the Committee were approached in the expectation of obtaining valuable information. Communications from Dr. E. J. Banzhaf, Dr. E. M. Houghton, Dr. J. W. M. Bunker and Mr. S. D. Beard reached us and some important points suggested by these workers have been incorporated in this report.

The paucity of new work in antitoxin preparation is due to a combination of several factors. War orders, of course, have occupied much time to the detriment of research, but perhaps the most important factor was the ill-success that has quite generally been experienced in the preparation of diphtheria toxin.

Since Witte peptone has become a scarce article on the American market many efforts have been made to find a suitable substitute. Progress unquestionably has been made in this direction, but as far as the Committee has been able to learn, no peptone has been placed on the market which gives generally satisfactory results. Some peptones that are readily available give good results for a period, and then suddenly without apparent cause—excepting the purchase of a new lot—toxin formation fails. But even when peptone of the same lot number is used the results are not uniformly favorable, a fact which seems to show that either the peptone is of uncertain composition, or, what seems more probable, that there are other factors involved which are as yet insufficiently understood.

Some manufacturers prefer to make their own peptone from pig, veal or calf stomachs or similar material. The exact method varies in different laboratories. Martin's peptone is made from pig stomachs by digestion with hydrochloric acid at 55° C. The period of digestion is 18 to 24 hours, and experience has shown that digestion should not be carried too far. This observation shows that for toxin production the meat or stomachs should not be broken down to a stage where peptones are predominant, but to a point where a generous quantity of albumoses is present. The ferment action is brought to a close by heating in a water bath and neutralizing the hydrochloric acid with sodium hydrate. The liquid after filtration represents a solution of peptone. This liquid peptone is quantitatively economical, since it is mixed in approximately equal quantity with meat broth prepared in the usual fashion. Usable toxins are frequently obtained by this method.

Dr. Hitchens gives the following method for preparation of peptone:

"The peptone which we use in the laboratories of Eli Lilly and Company for preparation of diphtheria toxin is the result of digestion with calves' stomachs. The temperature conditions and the length of time allowed for digestion will influence the quality of the peptone which is secured. While we are able to secure peptone which is very favorable for the growth of the usual organisms, or in making up the usual line of laboratory media by digestion for a long period of time, we have found that it is advisable to digest for a rather short period of time in making the peptone for diphtheria toxin preparation. Inasmuch

as we are making peptone for our own use only, we do not carry the process of manufacture to drying the material. We compute the percentage of peptone present in the digested fluid and use this hydrolized liquor in proper proportion to give a broth of about 1.5 per cent peptone."

Dr. Houghton states in his communication that uniformly good results have been obtained in the laboratory of Parke, Davis and Company by using their own peptone. By the use of starter flasks, adjusting the reaction to a deep pink with phenolphthalein and by incubation for at least twelve days, potent toxins can invariably be obtained. A culture of good toxicogenic power must be used.

The kind of meat used for preparing the broth is considered important by some workers. These state that young veal, carefully freed from fat and tendon is preferable to beef. Other workers believe that beef is as efficient as veal.

An important point has been brought out by research carried on during the past four years, namely, the method of adjusting the reaction of the broth. It seems that the most reliable method is the adjusting of the hydrogen ion concentration to 7.4 to 7.6. Outside of these limits potent toxins are rarely obtained. American peptones, as a rule, are of less uniform composition than Witte peptone and a delicate adjustment of the reaction is therefore imperative. The colorimetric method is accurate enough for adjusting the hydrogen ion concentration and phenolsulphonephthalein covers the range in a satisfactory manner.

However, there is a difference of opinion on the subject. Dr. Houghton states that when Parke, Davis and Company's peptone is used the reaction should be adjusted by the use of sodium hydrate until a deep pink is produced with phenolphthalein. This reaction should be checked by using standardized boric-acid-potassium chloride-sodium hydroxide, Ph=8.2 and Ph=8.4 solutions, and 0.5 cc. of phenolsulphonephthalein solution as indicator. The reaction should be equivalent to a Ph=8.2 value.

Another important point is the period of incubation of the toxin. When Witte peptone was used, incubation of seven days at 35 to 36° C. usually gave satisfactory results. Growth and toxin formation of the diphtheria bacillus on broth made with American peptone is more variable than when Witte peptone is used, and the incubation period should be limited accordingly. The period may vary from three to nine days. The most suitable time to remove the toxin from the incubator can be determined by the hydrogen ion concentration. This can be done after some experience by making one or two tests from the same flask. With proper precautions the requisite amount can be removed from the flask without incurring the risk of destroying the film or admitting foreign organisms. During the initial period of incubation acid is formed and after a few days the reaction reverses to alkaline. When the original reaction of the broth has been slightly exceeded in alkalinity, the toxin formation usually has reached the highest point. According to Dr. Bunker's work the most favorable period for harvesting is when the hydrogen ion concentration has reached Ph 7.8 to 8.0. If incubation goes beyond this period the potency falls rapidly, and if the toxin is removed before this reaction has been reached the highest point of toxicity has not been attained.

Dr. Houghton disagrees with Dr. Bunker and states that the toxin may be gathered for days after the maximum has been reached without material loss in potency. In the laboratory of Parke, Davis and Company toxin is incubated for at least twelve days.

On the whole it appears to the Committee that our knowledge of the conditions affecting toxin production by the

diphtheria bacillus has advanced sufficiently to demonstrate that efficient toxins can be prepared by the use of American made peptones, and that we need not depend upon foreign importations.

The use of 0.1—0.2 per cent dextrose in diphtheria broth is unnecessary when some kinds of peptone are used, according to certain reports.

In the refining of the product it seems that very little progress has been made. The aim is, of course, the preparation of a uniform product, of high multiple of concentration without undue increase of solids and viscosity, and the elimination of proteins known not to contain antitoxin. This last property is of importance chiefly for the reduction of the so-called serum disease. The Banzhaf method, as far as the Committee has been able to ascertain, is still the most commonly practiced, although some manufacturers hint at slight modifications of the process. The use of phenol or a phenol compound in place of chloroform as a preservative for the plasma is advocated by some. According to a communication from Dr. Banzhaf the use of phenol in quantities of 2.5 to 3 c.c. per liter prevents clotting of the plasma, makes for a higher concentration by increased elimination of useless proteins, and renders the end product clear and stable. As a consequence filtration through a Berkefeld filter is materially facilitated. Miss Homer in the Lister Institute in England has published a series of papers on antitoxin concentration, and advocates the use of 2 per cent of sodium chloride in addition to the usual amount of ammonium sulphate. She also recommends the adjustment of the reaction of the plasma to about Ph 7.8 as an alternative. The same author recommends the use of cresylic acid in amounts of 0.25 to 0.3 per cent for obtaining high concentration and a clear, easily filtrable end product. She advocates further the extraction of the 30 per cent precipitate with sodium chloride according to the original Gibson method, and claims that when this is done the loss of antitoxin during manipulation can be reduced to a negligible quantity of about 2.5 per cent. The Committee has not been able to ascertain whether Miss Homer's suggestions have been extensively practiced by American manufacturers.

The following statements were received from Dr. E. J. Banzhaf: To prevent clotting 0.25 to 0.5 per cent of phenol in the plasma gives the best results. In order to obtain a clear end product the plasma should be clear. This can be accomplished by filtering the plasma through two or three layers of cheesecloth to remove the slimy and insoluble portions which are usually present in plasma after standing. The heating of the plasma with the required amount of ammonium sulphate solution should be rapid up to 57° C., and then gradual heating to 60° C. This should take one and one-half to one and three-quarters hours, then about fifteen minutes from 69 to 62° C. If plasma is highly colored the end product will reflect it. This can be partly overcome by redissolving the pseudo-globulin precipitate containing the antitoxin and re-precipitating. Starving the horses before bleeding, i. e., not feeding them the day of bleeding, and allowing the dialyzed product to age in the ice box at least six months before pulping and Berkefelding improves the clarity of the product.

A difficulty—also owing to the war—has been experienced in obtaining a suitable quality of trikresol which is now generally used as a preservative for the finished product. The restraining and germicidal properties of various trikresols, purified kresols, orthokresol, etc., are not the same and the influence on the physical appearance of the end product is variable according to the preservative used. Some kresols slowly produce a precipitate and the refined product has to be kept for days or weeks before filtration. According to Krumwiede and Banzhaf precipitation is largely pre-

vented if kresol is added after solution in an equal volume of ether. If filtered too early a precipitate may form making a second filtration necessary. Some sera possess a fair degree of clarity after dialysis, but become cloudy after the addition of trikresol. This cloudiness is sometimes so intense as to render the product decidedly unattractive. Reconcentration as recommended by Heineman is a successful remedy for this condition, but, of course, entails additional labor and expense.

Turbid sera are not infrequently encountered before the preservative has been added. Some workers believe that the plasma of cetain horses always yields a turbid product, while others believe that the plasma of the same horse sometimes yields a clear and sometimes a turbid product.

As a result of the observations contained in this report the Committee submits the following subjects for exhaustive investigation, and makes the plea that results be reported to the Committee:

1. Toxin production.
   a. Methods of preparing the broth
   b. The kind of meat most suitable
   c. The kind of peptone
   d. The period of incubation
2. The concentration of the plasma
   a. Is oxalated or citrated plasma preferable?
   b. The kind of preservative for the plasma
   c. The conditions governing the production of a readily filtrable solution after heating the plasma-ammonium sulphate mixture
   d. The conditions governing the physical properties of the end product, namely color, clarity and viscosity
   e. The kind of kresol most suitable for preservation of the end product
   f. The minimum period that should elapse between the termination of dialysis and the filtration through a Berkefeld filter

The Committee finally wishes to state that this report should be considered a report of progress, but that the time for adoption of uniform methods has not yet arrived.

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CORRECTION

In the May issue of the JOURNAL, page 405, the title of Dr. Charles Edward Ziegler, author of the paper on "How Can We Best Solve the Midwifery Problem?" is erroneously given as "Professor of Obstetrics, University of Pittsburgh."

Dr. Ziegler resigned this chair in 1918, as a result of events which are narrated in his paper, and has since had no connection with the School of Medicine. On account of these special circumstances, we feel that we owe it to Dr. Ziegler to make clear that he is in no wise responsible for the publication of this title.

A Forward Step.—A long forward step has been taken in New York State by the enactment of a law providing that health officers shall be appointed for four-year terms and shall not be removed except on charges. The same rule might well be made country-wide in application and extended to other municipal, county and state officials where adequate civil service regulations do not already govern appointments and removals.—*Engineering News-Record*, April 20.

THE BACTERIAL ACTION OF DRY CLEANING

LLOYD E. JACKSON
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AN INVESTIGATION of the bacterial action of the process of "dry cleaning" garments, with solvents such as gasoline and benzol, has been made at the Mellon Institute of Industrial Research of the University of Pittsburgh, as a part of the regular program outlined for the year's work of the Multiple Industrial Fellowship of the International Technical Society of Cleaners and Dyers, which is an organization of eleven of the largest and most progressive members of the National Association of Dyers and Cleaners.

The tests were conducted in coöperation with the Department of Biology of the College of the University of Pittsburgh. The cultures of bacteria were prepared and the laboratory work in connection with the investigation was done in the University of Pittsburgh laboratories, where special equipment is available. John C. Fettermann, Ph. M., Dean of the College and Professor of Biology, directed, and W. H. Emig, Ph.D., Assistant Professor of Biology, conducted the actual bacteriological work relating to the tests. Professor Fettermann is a specialist in inquiries of this nature, having made a number of similar investigations in connection with foods, the handling of milk, etc. The work at the plants was done under the immediate supervision of the author, who is the senior incumbent of the Industrial Fellowship, with the direct coöperation of the owners of the local plants.

Since this investigation was made in plants using methods and equipment recognized by the National Association of Dyers and Cleaners, a distinction must be drawn between competent dry-cleaners and those who, though posing as dry-cleaners, do not use recognized methods and have not the facilities to do proper cleaning. The National Association of Dyers and Cleaners is an organization of cleaners who must measure up to the recognized standards of methods and equipment. There are 1,200 members of this Association, each representing a cleaning plant. The capital invested in these plants is about $36,000,000; the annual volume of business is about $48,000,000; the number of employees is approximately 32,000, and the average number of accounts run is in the neighborhood of 4,800,000.

Aside from a few plants using recognized methods, which are not represented in the National Association of Dyers and Cleaners, there are thousands of places represented to the public as cleaners or cleaning establishments which have no right to be classified as cleaners at all. Many of them do their work in sheds or cellars or in back rooms, in open washers or on scouring tables, and send the part of their work which can not be made presentable by these superficial methods to some better equipped cleaning plant. It is estimated that there are 200,000 such places in the United States and Canada. The following is an extract from the 1920 report of the State Fire Commissioner of the State of Nebraska, made by Fire Marshal C. E. Hartford (extract from page 18), and may be considered as representative of the condition throughout United States and Canada:

> In some smaller cleaning plants our inspectors find a small galvanized bucket which holds about 2½ gallons of gasoline. The owner takes the skirt or jacket, dips it into the bucket so as to thoroughly saturate the garment. He then takes the garment up, wrings it out with his hands, places it on a hanger and hangs it up in the back room.

When he finishes, he pours the dirty gasoline back into the can, puts the cork back, sets it under the stairway and goes back to his pressing machine.

Now, anyone who understands proper cleaning of garments will know that the garment was not cleaned. Yet the surface soil may have been removed or spread evenly over the surface, and the general appearance might be fair until it is worn for a little while. The same thing is done with suits.

This condition exists in quite a number of localities. This is often found by our inspectors. The main purpose of my theme, however, is not only to show the danger from the illegitimate use of gasoline, but also the extent of frauds being practiced on the public.

It is obvious that sanitary efficiency under these conditions cannot be very high.

The following is Professor Fettermann's report, which is based on results of the investigation conducted in the plants of two Pittsburgh, Pa., members of the International Technical Society of Cleaners and Dyers:

I submit herewith my report on the results of the investigation conducted for the purpose of determining the bacterial efficiency of the method of dry-cleaning as conducted by two companies located in the city of Pittsburgh.

Plant No. 1.—The method employed at this plant involves the use of benzol and unsaponified fats. The routine is indicated herewith:

First run in benzol and soap.....15 min.
Rinse in distilled benzol..... 5 min.
Run in tumbler, temperature 60°.....15 min.
Put over pressing machine; steam pressure, 90 pounds.

Pieces of cloth, one inch square, were inoculated from a culture of the common hay bacillus, and then allowed to dry at room temperature. A number of these unit pieces of cloth were attached to a garment at the beginning of the cleaning process and one was removed after the clothing had been centrifuged, another after treatment in the tumbler, and a third after the garment had been through the pressing operation. The determination of the number of bacteria present was then made and comparison made with the bacteria found present in the untreated sample. In the second series of the experiments at Plant No. 1, live steam was introduced into the tumbler for a period of five minutes. In connection with the second experiment conducted at each of the plants, the pieces of cloth were inoculated from a culture made up largely of lactic bacteria.

First Series

	Bacterial counts
Control	580,000
Centrifuge	180,000
Tumbler	80,000
Pressing operation.....	40,000

Efficiency, 93.10%

Second Series

	Bacterial counts
Control	1,200,000
Centrifuge	370,000
Tumbler	180,000
Tumbler and live steam (5 min.)	50,000
Pressing operation	500

Efficiency, 99.96%.

Plant No. 2.—A similar investigation was conducted at a second plant, where gasoline is employed in the cleaning process. The routine observed at this plant is as follows:

First run in gasoline and soap .....30 min.
Rinse in distilled gasoline.....20 min.
Tumbler .....30 min.
Put through pressing operation.

First Series

	Bacterial counts
Control	500,000
Centrifuge	200,000
Tumbler	100,000
Pressing operation	50,000

Efficiency, 90%

Second Series

	Bacterial counts
Control	2,700,000
Centrifuge	150,000
Tumbler	165,000
Pressing operation	200

Efficiency, 99.99%

These experiments reveal the fact that the efficiency of the method of cleaning employed at Plant No. 2, as well as at Plant No. 1, is unusually high. The destruction of the organisms which are utilized in these experiments, notably in the case of the hay bacillus, would indicate that pathogenic organisms, such as the tubercle bacillus, the bacillus of diphtheria, as well as typhoid fever, would undoubtedly be destroyed. Herein would lie one

of the strongest points in favor of the cleaning process employed.

Discussion of Prof. Fettermann's Report

The hay bacillus (B. subtilis), used to inoculate the test pieces of cloth for the first series of tests, is one of the most hardy bacteria. It is quite conservative to say that conditions that will kill this bacteria will also kill any of the disease-causing bacteria (pathogens). The hay bacillus is widely distributed in earth, air and water, and was formerly regarded as one of the most typical of non-pathogenic organisms. Lately it has been proved capable of producing spontaneous infection in man.

The lactic bacteria employed for the second series of tests were obtained from milk and may be considered a representative type of bacteria found on garments, due to dropping food, etc. These organisms are less hardy than the hay bacillus—i. e., they are more easily destroyed.

The tests described in this report are unique in that practically no work of this nature has been published before. A search of the bacteriological literature reveals no published results of tests made to determine the germicidal efficiency of the "dry-cleaning" process. A number of tests of the germicidal efficiency of laundering have been carried out and published in public-health periodicals. Notable among these are the results reported in the AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. VIII., No. 7 (July, 1918), pages 494 to 498, "On the Bactericidal Efficiency of Soap Solutions in Power Laundry," by Elledge and McBride. Dr. Elledge at that time was a Senior Industrial Fellow of the Mellon Institute of Industrial Research, engaged in research for the Laundry-owners National Association.

In conclusion, it may be stated that the "dry-cleaning" process has a very high and hygienically satisfactory bactericidal efficiency, as measured by the standards used in public-health work for laundering, treating drinking water, milk and food products.

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METHODS SUGGESTED FOR THE EXTERMINATION OF MOSQUITOES

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Read before the Sanitary Engineering Section of the American Public Health Association, at the Fiftieth Annual Meeting, New York City, November 17, 1921.

FROM the point of view of the practical worker as distinguished from that of the entomologist, mosquitoes fall into three groups: (1) those which transmit disease, (2) those which constitute a nuisance, and (3) those which are entirely innocuous.

Fundamentally the life-cycles of all mosquitoes are the same: the egg laid in mud or water; the growth and development of the larva and pupa in water; the emergence of the adult and its search for food.

It would be futile to attempt the extermination of mosquitoes after they had reached the wing. Their freedom of action, their numbers and their general distribution would make such a course highly impracticable if not impossible. On the other hand, in the immature stages they are limited to certain relatively prescribed areas, dependent upon

certain conditions. It is at this point that they are most vulnerable, for the breeding areas may be found and eliminated, the conditions necessary to development may be changed.

In other words, the character of any antimosquito campaign is determined by two biological considerations:

1. That water is the only habitat of the larvae and the pupae of the mosquito.
2. That in these stages all but one of the species of economic importance must periodically rise to the surface for oxygen.

A mosquito-control campaign as thus determined consists of:

1. The inspections necessary to disclose the breeding areas and to keep them under observation.
2. Temporary or biological measures such as the use of oil, fish, screens and other means of destroying or preventing breeding without removing the source.
3. Permanent or engineering measures such as ditching, pumping, filling and the like to remove the source of the breeding.

In general, the extent of the "controlled" zone containing and surrounding the community to be protected depends upon the range of flight of the species involved. Some mosquitoes, such as the salt marsh varieties, are habitual migrants flying in appreciable numbers from thirty to forty miles from their place of origin. On the other hand, the malarial mosquito has never been positively traced further than one mile from its source, although the evidence does not preclude a longer flight under favorable circumstances. The determining factors are undoubtedly the size of the brood reaching the wing, the search for food and for water in which to oviposit, the direction and velocity of the wind, temperature and humidity. The semidomesticated species are probably actuated by blood-hunger and usually seek human habitations. There is evidence to show a movement of the house-mosquito (*Culex pipiens*) for several miles against prevailing winds toward a large center of population.

A general rule that will serve in most cases where the salt marsh species are not present, can be stated as follows:

1. Eliminate all breeding within the area to be protected.
2. Control all open breeding places such as marshes, pools, streams and the like, in a half-mile zone surrounding the area to be protected.
3. Control all large marsh areas (25 acres or more) in an additional one mile zone.

Having assembled definite information regarding the local problem and having formulated a general plan for its solution, the health officer or other interested person is then ready to fire the opening gun of his campaign. This is, of course, an educational drive to bring the people of his community to a realization of the need for action and of the practicability of an antimosquito campaign. A vigorous educational and publicity campaign in a community that is really faced with a mosquito problem cannot fail to arouse public interest to a point where funds will become available either through private subscriptions or by action of the local governing body.

However it may be financed, if no provision is made for a commission or other special body to assume its direction, the project would logically be placed in the hands of the local board of health with the health officer in direct and active charge. If conditions are such that an intercommunity campaign is necessary, representatives of the various health boards might constitute a supervisory committee with a properly qualified expert in charge of the work.

The first step in actual operations is to find the breeding places. This involves a thorough canvass of every yard and premise in the community as well

as of every square yard of open or wooded country in the territory included in the project.

This work may be divided into:

1. House to house inspections.
2. Field inspections.

In the house to house inspections a sharp lookout must be kept for cisterns, cesspools, privy vaults, manure pits, blocked roof-gutters, flooded cellars, rain barrels and similar receptacles. Premises of stables, green-houses, truck-farms, cemeteries, blacksmith shops, tanneries, hat factories, and similar establishments where containers, tanks and vats are usually found, should receive particular attention.

As a rule these inspections need be made but twice a month. Some sections of an urban community may require only one or two inspections during an entire season. In rural or suburban sections where the houses are widely scattered these inspections may best be combined with the regular field inspections.

The frequency of field inspections depends upon the season and the corresponding period of incubation. Under climatic conditions that usually prevail in this vicinity (New York), three weeks is a safe allowance in May, in June twelve days, in July, August and September eight days.

It is well to divide the territory to be controlled into sections, each constituting one day's work for one inspector under normal conditions, yard and field inspections to be combined or kept on separate schedules as local conditions may require. In the built-up sections of suburban communities 100 to 200 yard inspections usually constitute a good eight hours' work. In the cities this number can be increased. In the open country three to six hundred acres will suffice for an inspector using a bicycle. Experience in each locality, however, must determine the final size of the sections.

It is likewise a good plan, if more than one inspector is used, to assign adjoining sections each day and have the men work through the territory in a group. This simplifies the handling of the men, and concentrates the oiling for the following day in one locality.

All mosquito extermination workers must be thoroughly impressed with the fact that in this work nothing can be taken for granted. A cover on a cistern is no guarantee that mosquitoes are not coming and going at will through a break in the coping. A pond full of fish may be as full of *Anopheles* larvae if vegetation is present in large amounts. A stream may go entirely out of its banks during a summer freshet, and upon the subsidence of the flood the swamp holes along its banks may be black with larvae and pupae. Mosquitoes will breed in the hoof-prints in pasture lots; in horse-troughs in constant use; in the flush-tanks of vacant dwellings; in fire-buckets; in fact, in a hundred unexpected places. There is no way by which one may know without actual examination whether or not a certain spot is breeding mosquitoes.

When searching for larvae it is not advisable to depend entirely upon sight even in comparatively clear water. Repeated dipping is the only safe procedure. A long-handled, white-enameled dipper is the most satisfactory aid. Sometimes dipping defeats its own purpose. Dropping a bucket into a well or cistern may give negative results, while the use of a pocket mirror to reflect a bit of sunlight to the bottom may disclose the breeding.

Having found the breeding, the next step is to destroy it. Although the use of oil and other larvicides should in every case be supplementary to such permanent measures as filling and draining, it must be resorted to in the control of areas or containers that cannot be eliminated, in the destruction of breeding that may occur in the drainage ditches themselves, and in many other cases where other methods are inadvisable or impossible.

The action of oil when used as a larvicide is largely mechanical. The for-

mation of a film upon the surface of the water prevents larvae and pupae from reaching the air, and causes suffocation. It is therefore apparent that the successful use of oil depends upon the quality of the film produced. This film should be continuous over the entire surface of the water. It should remain unbroken for at least three-quarters of an hour, preferably longer. It should spread rapidly and evenly. It should be of sufficient body to retain its killing qualities for several days.

Long experience shows that the most effective oil for this purpose is a "straight-run gas oil" as it is known at the refineries. This is a fuel oil ranging in gravity from 36° to 38° Baumé and in viscosity (Saybolt) from 34 to 38 drops per minute at 100° F. There is practically no fire hazard connected with its use. It will not burn when on the surface of the water. It is ignited in bulk with difficulty. It will, however, somewhat increase the inflammability of wood, straw and similar material with which it comes in contact. For this reason care should be exercised when spraying under buildings, around lumber piles and the like.

It is well, when purchasing oil for this purpose, to specify exactly what is wanted. If fuel oil is asked for, any one of half a hundred grades and qualities of oil may be supplied, some of them absolutely unsuited for the work required.

Oil is best applied by means of a sprayer, although in a pinch it can be spread satisfactorily with a tomato can and a quick flirt of the wrist. Three types of sprayers are in common use.

1. The knapsack sprayer. While this sprayer leaves the hands free in traveling over difficult ground, its dead weight on the back becomes exceedingly irksome. The operator is usually drenched with oil. Its range is short and the stream comparatively weak.

2. The compressed air sprayer. This sprayer is carried on a strap slung over one shoulder leaving the hands free when walking. Its range is short and the stream is weak.

3. The cylindrical pump sprayer. This sprayer consists of a cylindrical container with a ball-valve pump attached. It is carried in the hand and placed on the ground when operated. It will throw a heavy stream with considerable force a distance of 25 to 30 feet.

Both cylindrical pump and compressed air sprayers should be kept on hand, the former for oiling pools, ponds and other areas that must be covered from the banks, the latter for oiling ditches and marsh areas through which it is possible to pick a way. They should be equipped with interchangeable "Bordeaux" nozzles and oil proof hose. The compressed air sprayer should, in addition, be equipped with a spring-cock valve operated by the thumb.

There is no better container for carrying and handling oil in the field than a square, five gallon can with a strap handle. It makes a compact load in wagon or truck and the broad handle and squat shape make carrying easy.

The amount of oil required per unit of area is a question that is often asked, but which cannot be answered satisfactorily. The amount of vegetation present, the quality of the oil, the skill and judgment of the operator, and the conditions under which the work must be carried on, are too variable to permit the formulation of an exact rule. A very rough estimate may be made by allowing 1 gallon of oil to 150 square yards of clear surface. This proportion may run three or four times as high if vegetation and other disturbing factors are present.

Certain classes of breeding places, such as storm-water catch basins, cisterns, cesspools and the like should be oiled on a schedule, because it is cheaper to oil in this way than it is to inspect and then oil where breeding is found. Usually two treatments a month will suffice. With

these exceptions the oiling operations should be entirely dependent upon inspection reports.

Larvicides, other than oil, have proven of such uncertain value for general operations that their discussion will be omitted entirely.

Although oiling and similar temporary measures have a proper place in mosquito extermination work, it is obvious that the most satisfactory results can be obtained by permanently eliminating the breeding areas by filling, if possible; otherwise by draining and pumping.

Drainage by means of open ditches for mosquito eradication purposes involves the following considerations:

1. The area in question must be thoroughly and completely drained.

2. The ditches must be of sufficient capacity to handle the run-off of a maximum rain-fall within five days, but they should not be larger than absolutely necessary.

3. They should be as few in number as is consistent with proper drainage.

4. They should follow the straightest possible course with laterals opening into the collecting ditch at an angle.

5. They should have sufficient fall to maintain a velocity that will prevent breeding and be self-scouring. A grade of approximately 8 inches in 1,000 feet is satisfactory.

6. They should have side slopes as steep as the nature of the soil will permit.

7. All ditching must be kept in a proper state of repair with a complete annual overhauling in the spring.

Tile drainage, substratum drainage, the control of tidal marshes by means of dikes, tide-gates, pumps and similar engineering projects are beyond the scope of this paper. Excellent material on this subject is available in the government bulletins.

There is one important matter, however, that must be mentioned in any discussion on the subject of mosquito extermination. That is the value of a continuous study throughout the season of the distribution, density and species of mosquitoes on the wing, for the purpose not only of checking up on the effectiveness of the work, but also to indicate the presence of neglected breeding areas within the "controlled" area and also to detect invasions from outside areas. Such a study should be based on systematic collections of adults in accordance with standardized methods of collection. Such collections properly charted on a map of the area in question, and analyzed as to species and numbers will constitute one of the most effective weapons in the armory of the man in charge of the campaign.

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SEATTLE'S LOW MORTALITY FROM INFANT DIARRHEA

Seattle has the lowest death-rate of any city in the United States with 250,000 population or over. Being a newer city it has the opportunity to profit by the mistakes made in housing and sanitation in older communities. As a result there is no congestion, and no slums exist. The death-rate among infants is very low, due in part to an even, equitable climate such as prevails on the coast strip west of the Cascade range from northern California to southeast Alaska, but also due in a large measure to a concerted effort to better conditions controlling milk supplies, and educate the public by means of literature, etc., on child hygiene. An inspiring example of what Seattle has accomplished by concerted effort in this field is the striking reduction in the death-rate from diarrhea and enteritis under two years, which fell from 37.1 per 1,000 births in 1905 to 4.3 per 1,000 births in 1919.—John D. Manning, M.D., *Mother and Child*, March, 1922.

THE AMERICAN RED CROSS DIET IN THE FAMINE DISTRICTS OF CHINA

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WHEN the responsibility of feeding starving Chinese in certain famine districts was definitely assigned to the American Red Cross, the director, Mr. J. E. Baker, asked this laboratory for a diet which would utilize cheap food substances available in the Orient. The substances selected had to be of such a nature that they could be transported during the winter season long distances from the nearest train and fed easily to men working on the Red Cross highways.

The following diet was suggested: The rations for 10 men for 1 day to consist of:

1. Bread 13.3 catties (1⅓ catties per man). The bread to be made of 40 per cent ground peanut press cake, or 40 per cent ground soy bean press cake and 60 per cent millet flour, cotton seed meal, wheat flour, maize flour or kao-liang.*

2. With the bread is also given a soup. The ingredients for 10 men for 1 day consist of: 4 catties of meal, of which at least one should be soy bean meal or peanut meal.

The other 3 catties may be any convenient cereal.

5 gallons water
10 catties fresh vegetables
1/5 catty salt
1/5 catty powdered limestone, chalk, or lime
1 catty pork, bean oil or any other cheap oil.

Directions: The meal is cooked in 5 gallons of boiling water for 5 minutes. To this stock are added the vegetables, salt, lime, etc., and the whole is boiled not longer than 30 minutes. The fresh vegetables are absolutely essential, and if cabbage, turnips, spinach, carrots, etc., are not available, beans may be sprouted on the spot and bean sprouts used.

The American Red Cross bought materials as follows:

	Cents per catty
A cheap rice	1.4
Peanut press cake	2.8
Cotton seed meal	1.4
Soy beans	4.2
Red kao-liang	4.4
Millet	4.4
Corn	4.4

Based on these prices the food for 10 men for one day only cost about 76 cents Mexican silver or about 38 cents gold, or about 4 cents gold per man per day.

The press cakes mentioned in this diet are the residues after the oil has been pressed out for sale. As a rule, from 5 to 15 per cent of oil still remains in the cake, and from 37 to 46 per cent of protein.[1]

The kao-liang mentioned here is a sort of grain sorghum which constitutes over 40 per cent of the crops of northern China.[2]

Analyses show the following composition:

Water	Fat	Ash	Protein	Crude Fiber	Carbohydrate
White kao-liang					
13.74	4.99	3.02	11.86	1.63	64.76
Red kao-liang					
9.07	4.71	2.50	9.46	1.77	72.49

The above diet was used practically throughout the Shantung area of the American Red Cross. To a lesser extent it was used also in the northern half of the Pingtingchow, Shansi operation, and in southern Chihli on the Hantan Taimingfu route. Everywhere the diet gave excellent results. The natives were in good spirits, their general health was

*The peanut press cake meal and soy bean meal to be used interchangeably, viz.: 20 per cent of each, or 10 per cent of one and 30 per cent of the other, to make 5⅓ catties in all. The maize, kao-liang, rice, etc., to be used in any proportion to make up 60 per cent or 8 catties. This mixture of flours to be made into Chinese steamed bread or eaten as a gruel. A catty is about 1⅓ lb.

exceptionally good, and they were entirely free from diseases due to deficient diets and malnutrition. They were also free from germ diseases.

A recent letter from Mr. Baker says in part: "This diet worked out excellently. The men were in splendid health, and in the Shantung area there were only five cases of death from disease out of the entire number of workmen employed. Sixty-one thousand were employed at one time or another, and the average of about 20,000 during the period of operations lasting over seven months was reached."

In the southern half of the Pingting-chow operation a native diet consisting of a monotonous succession of kao-liang and millet was used. The health of the men receiving this diet was in striking contrast to that of those receiving the soy bean diet. The men on the millet and kao-liang diet were lacking in energy, their general health was poor and they were easy prey to every contagious disease. Mr. Baker writes: "I may say that the men on the millet and kao-liang diet are even now not as well and vigorous as those in the northern part of the same operation."

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CONTRIBUTORS TO THIS ISSUE

Those who were present at the Baker dinner recently know all about the life and works of **S. Josephine Baker.** She is both an M.D. and a D.P.H, and is one of the few women holding the rank of surgeon of the U. S. Public Health Service. In her twenty-three years of active service, over twenty of which have been spent in the New York City Health Department, Dr. Baker has been a special agent of the Children's Bureau, a practicing physician, a member of the Columbia and Bellevue faculties, president of the American Child Hygiene Association, and other things too numerous to mention.

Dr. T. M. Rivers, associate in bacteriology at the Johns Hopkins Medical School, has conducted extensive researches in the pathology and bacteriology of influenzoid organisms of various strains, and of other respiratory diseases. Previous to coming to Hopkins, he was stationed at the Santo Tomas Hospital, Panama.

Dr. William Hallock Park is one of the best-known bacteriologists in the country. He has been director of the New York City Health Department Research Laboratories continuously since 1894, is on the faculty of University and Bellevue Hospital Medical College, and is widely known as the author of *Pathogenic Microörganisms* and as the editor of Park's *Hygiene.*

Dr. Hazel M. Hatfield, a graduate in arts and medicine of Cornell, has had charge for the past six years of the bacteriological Milk Laboratory of the New York City Health Department, which is probably the largest of its kind in the world, handling about 60,000 samples a year. The bacteriological milk examination has supplanted, to a considerable extent, the physical inspection of the country sources.

Dr. W. W. Skinner has been on the staff of the Bureau of Chemistry, U. S. Department of Agriculture, for eighteen years, at first as a food chemist, but since 1908 as chief of the Water Laboratory. His varied researches in the chemistry of waters and solutions have admirably fitted him for an authoritative pronouncement on soft drinks.

Dr. H. E. Barnard has had an extensive career in state public-health work, first in New Hampshire, where he served as chemist to the Board of Health, and then in Indiana, where he was state food and drugs commissioner and commissioner of weights and measures. He was also a food and drug inspection chemist of the U. S. Department of Agriculture and a member of the Federal Food Administration before entering the field of industrial research.

Dr. J. W. Robinson, deputy health officer of the Los Angeles County Department of Health in charge of contagious diseases, was in private medical practice for several years after receiving his degree from the University of Illinois. In 1910 he was put in charge of the health of several thousand employees on a Mexican railroad, where he

(*Continued on page 561*)

EDITORIAL SECTION

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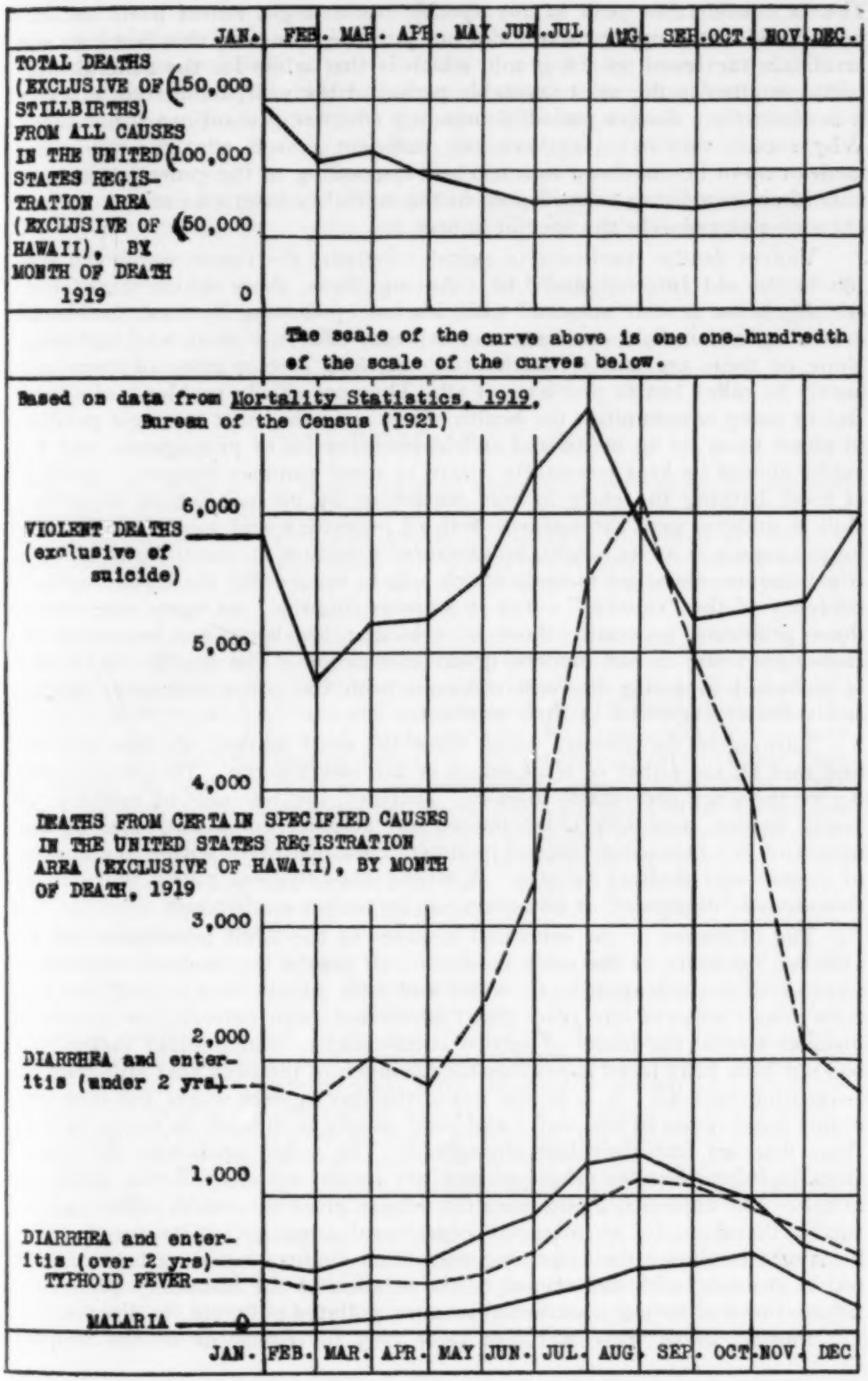
MAKE THIS THE HEALTHIEST SUMMER!

Seasonal mortality and morbidity are no new ideas to vital statisticians. Whether they have been taken to heart as thoroughly as they should be by health administrators who control policy and appropriations, is another question. That respiratory diseases are primarily winter diseases, reaching their peaks in January and February, is a commonplace, and there is no gainsaying their deadly importance in the sanitarian's scales. The main and most persistent effort of every health officer must always be against the pneumonias, influenza, diphtheria, measles, whooping cough, bronchitis, and tuberculosis, in all their varieties.

But every springtime reminds us again that there exists a smaller group of less deadly diseases which take their main toll in the months of summer and early fall. We amused ourselves recently by looking over the 1919 volume of the Census Bureau's *Mortality Statistics* and jotting down some monthly figures in the form of a graph. The result is seen on the opposite page.

The first fact that strikes us in examining the upper part of the chart showing the total deaths in the Registration Area from all causes is that the line from June to November is almost straight, running uniformly under 80,000 deaths a month, and that, indeed, these figures are the lowest of the entire year—certainly a favorable showing.

Looking to specific causes of death, however, we note the five major ones which show marked upward trends during the summer months. Comparison of the "all-causes" curve with the specific curves is not a strictly accurate procedure, for the reason that exigencies of space have compelled us to use different scales, allotting the same amount of vertical rise to 100,000 deaths from all causes as to 1,000 deaths from one of the five specific causes.


JAN. FEB. MAR. APR. MAY JUN. JUL AUG. SEP. OCT. NOV. DEC.
TOTAL DEATHS (EXCLUSIVE OF STILLBIRTHS) FROM ALL CAUSES IN THE UNITED STATES REGISTRATION AREA (EXCLUSIVE OF HAWAII), BY MONTH OF DEATH 1919
150,000
100,000
50,000
0
The scale of the curve above is one one-hundredth of the scale of the curves below.
Based on data from Mortality Statistics, 1919, Bureau of the Census (1921)
6,000
VIOLENT DEATHS (exclusive of suicide)
5,000
4,000
DEATHS FROM CERTAIN SPECIFIED CAUSES IN THE UNITED STATES REGISTRATION AREA (EXCLUSIVE OF HAWAII), BY MONTH OF DEATH, 1919
3,000
2,000
DIARRHEA and enteritis (under 2 yrs.)
1,000
DIARRHEA and enteritis (over 2 yrs)
TYPHOID FEVER
MALARIA
0
JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC

Thus a considerable peak in any specific cause might reflect itself but imperceptibly in the upper curve. For our purpose, however, this fact does not invalidate the lesson of the graph, which is that while for the general mortality, summer is the most favorable period of the year, for certain diseases it is distinctly a danger period, demanding effective precautionary measures. Why should this be? Is there any sufficient reason why these summer modes cannot be cut down to a level corresponding to the general healthfulness of outdoor living as evidenced in the mortality from all causes? Let us examine more closely the specific causes.

Violent deaths (exclusive of suicide) includes the causes numbered 164-186 in the old International List. Among these, those which might conceivably show a wide seasonal variation are: poisoning by food, accidental drowning, automobile accidents and injuries, effects of heat, and lightning. None of these are major health problems, and in fact most of them can hardly be called health problems at all. They are chiefly problems of safety. But in many communities the health officer is in the most strategic position to affect them by an occasional and inexpensive bit of propaganda, and the public should be kept constantly aware of these summer dangers. Spoilage of food, bathing too early in cold waters or by persons whose swimming skill is undeveloped, carelessness both of pedestrian and motorist when the tourist season is at its height, unwarranted exposure to sunstroke or to electrical storms—these are matters which help to account for the erratic upward tendency of the "violence" curve in summer months. As every one knows, these problems, especially those of vehicular accidents, are becoming increasingly acute in our modern urban civilization. The health officer who is interested in saving life will coöperate with the police and other officials and voluntary agencies in their solution.

Turning to the diseases which show the most marked summer rise, we find that all are either of fecal origin or are insect-borne. To a remarkable degree these are preventable diseases. Diarrhea, the *bête noir* of mothers of young babies, popularly characterized as "summer complaint" and by the notion of the menacing "second summer," lies distinctly within the control of dietary and sanitary science. A strong child-hygiene policy will cut off this annual "mountain" at its source—in imperfect mothercraft.

The incidence of the intestinal diseases in the adult population can be attacked by many of the same methods. Of course the modern community pays particular attention to its water and milk supply, and so well has this been driven home of late years that typhoid and adult enteritis are vanishing diseases within the limits of settled communities. But another factor that has not been fully faced is responsible for much of the peak that still remains —vacation typhoid. It is in the out-of-the-way resorts where full-time scientific supervision of the water and food supply is difficult to maintain that these diseases find their last stronghold. The minor epidemics that occasionally follow Sunday-school picnics are ample evidence of the source of attack. The approach of the vacation season gives the health officer opportunity, therefore, for an intensive educational campaign. City people must be taught to choose their camping sites, their country boarding homes, their picnic grounds, with due regard to the relation of the insanitary privy, the infected well or spring, unscreened manure, polluted milk, etc., to disease.

Finally, all of these warnings serve only to remind us of the ubiquity

of man's two great insect enemies—the fly and the mosquito. That malaria finds its sole carrier in the latter is now a practical certainty. And the success of demonstrations of malaria control, which have been made in Alabama and other mosquito-ridden regions, is earnest that the South and the coastal plains can be made as free from this disease as cooler or higher sections of the country. But the mosquito or fly campaign that bases its hopes on vigorous "swatting" or various species of traps, however meritorious, can never attain complete success. The modern emphasis on prevention demands that breeding-places be sought out and made inhospitable to larvae and young alike.

These, then, are a few of the measures which the progressive sanitarian will be utilizing this summer to reduce those "steeples" to the all-the-year-around level. And let him not forget that a coöperating public is the absolute prerequisite to his goal.

ONE WOMAN'S LIFE

A notable event in the history of child hygiene, as well as of the feminist movement, was the testimonial dinner to Dr. S. Josephine Baker, given at the Hotel Commodore, New York City, April 25. Dinners to women are not frequent; dinners to women physicians still fewer; and dinners to pioneer women public-health officials who have served continuously through twenty years of political vicissitudes are unique.

Since the year 1908, in which she established the first bureau of child hygiene in America, the baby death-rate in New York City has fallen from 144 deaths under one year of age per 1,000 births to 71.1 in 1921, a toal saving of 82,549 lives over what would have occurred had the death-rate of 1908 continued. Dr. Baker feels that this achievement, while gratifying, has been the easiest part of the record, and says that another halving of the infant mortality of New York City within the next ten years is quite within the range of possibilities. The baby death-rates in the most congested foreign-speaking quarters of the city are lower than those in the best districts of Park Avenue and Riverside Drive. The foreign-born population, larger in New York than in any other great city in the world, has been willing and anxious to learn from Dr. Baker's indefatigable cohort of more than 500 nurses and specialists, scattered through 68 baby-health stations and prenatal clinics.

So that the problems in child hygiene which Dr. Baker foresees to be the primary ones of the future are the education of the native white American to higher standards of responsibility, in the increase of the birth-rate among parents of superior qualities, as well as the reduction of the death-rate; the attainment of better dietary knowledge and its diffusion throughout all classes of society; the rescue of the pre-school-age child from the relative neglect into which he has fallen between the maternity clinic and the primary school, and of the adolescent industrial child compelled to leave school for gainful employment; the thorough periodical physical examination of all children for the discovery and forestalling of the commoner defects; the systematic training of future generations of mothers in little mothers' leagues and similar organizations.

The distinguished service of this great woman, happily recognized in the full tide of her achievements, with no thought other than for a future of no less length and even greater fruition, should be the one incentive needed to all child hygienists to push forward to a complete conquest of the problems toward which Dr. Baker has blazed the way.

JULES SCHEVITZ
1897-1922

Jules Schevitz, general secretary of the Oklahoma Public Health Association, died on March 22, 1922, at the age of 24, at the very dawn of a promising career of attainment and service. Even at his early age, he had attained a degree of prominence and accomplishment usually unsurpassed by men of maturer years. The remarkable and affectionate tribute of his friends and admirers, coming from all corners of Oklahoma on the day of his funeral to do homage to his memory, eloquently bespeaks his degree of attainment and service, and the place which he had won for himself in the hearts of all.

Jules Schevitz was born in Brooklyn, N. Y., on June 1, 1897. Educated in the public schools of the city, he rapidly made his way to Townsend Harris Hall and later to the College of the City of New York, from which he received the degree, Bachelor of Science in 1917. At the end of his junior year in college, he developed pulmonary tuberculosis and through the active interest of his friends, and especially of Professor C.-E. A. Winslow, he was able to spend a year at Trudeau, N. Y. There he had the good fortune to come under the spell of Dr. Edward Livingston Trudeau, a pioneer in sanatorium treatment of tuberculosis in the United States.

At the end of one year, he returned to New York City, robust in health, and mature in thought. He resumed his studies at the College of the City of New York, specializing in the biological sciences, and particularly in public health. His schedule being light, he undertook a public-health survey of Union Hill, N. J., which he conducted in a highly efficient and satisfactory manner. During the summer, he conducted a tuberculosis survey of the State of New Jersey.

In September, 1917, at the age of 20, this youth was appointed secretary of the Oklahoma Tuberculosis Association. Little had been done in the organization and conduct of the antituberculosis work in Oklahoma, and almost single-handed, Mr. Schevitz had to begin to build the splendid monument to tuberculosis and public-health work which he left behind. Plunged into the seal sale campaign immediately after his arrival in Oklahoma, he was able to raise $40,093.67, an increase of 2,000 per cent over the amount raised the preceding year. This insured an extensive and progressive public-health and tuberculosis campaign during the coming year.

An active and interested executive committee for the State Association was appointed, and similar committees were found to serve first in the larger municipalities and then in the more rural parts of the state. Trained tuberculosis and public-health nurses were carefully selected from all parts of the United States. Tuberculosis clinics were established and placed under competent medical supervision, infant and child welfare work was initiated and conducted, and similarly, school nursing activities were begun and fostered all over the state. Special attention was given to the introduction of public-health activities among the Indians and Negroes, and to the care of discharged tuberculous soldiers.

Realizing the need of improving the general public-health situation in Oklahoma, as a means of combating tuberculosis, Mr. Schevitz instituted a series of public-health surveys in the larger cities in Oklahoma, thus conducting a thorough, state-wide public-health survey of urban conditions in an American state for the first time. Public-

health nursing institutes were held from time to time, exhibits were planned and erected, special pamphlets on tuberculosis, infant and child welfare and on the communicable diseases were printed and widely distributed. Other methods used in the campaign of public-health education, and particularly the medium of the newspaper, were employed. Mr. Schevitz also edited a popular monthly bulletin which contained all the news of the activities of the Association. In addition, he served as a contributing editor to the *Nation's Health*.

Realizing the need of adequate hospital facilities for the care of the tuberculous in Oklahoma, Mr. Schevitz waged a legislative campaign for sanatoria, and succeeded in getting the legislature to pass a bill providing for the construction and maintenance of three sanatoria—two for whites and one for the colored tuberculous at Clinton, Talinina, and Boley, Oklahoma.

The above, which is but an incomplete list of the activities and attainments of Mr. Schevitz, speaks very highly of his fruitful young life. As a worker he was indefatigable, and there was no limit to his aspirations for the improvement of the public health of Oklahoma. In the brief span of four years and six months, he had placed Oklahoma in the forefront of public-health progress, and made her name known abroad as well as at home.

He loved Oklahoma. To him it was a land of rare opportunity. He saw its tremendous possibilities and strove as hard as he knew how to make his particular contribution to its devolpment. He came to give to Oklahoma, and in so doing he was amply rewarded. His was the durable conquest, one that will linger in the minds of men for many years, and in the work of the Oklahoma Public Health Association, as long as it endures.

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LETTERS TO THE EDITOR

Dr. Smith's Diet

Statements made by Dr. Stephen Smith in interviews stimulated by the public interest in his advanced age, following the recent semi-centennial celebration, have been misinterpreted and misquoted in a number of newspapers over the country. Dr. Smith has sent the JOURNAL the following letter to counteract the abuse of these statements by propagandists:

DEAR SIR:

In denial of the statements printed in some of the newspapers recently, let me say that I never said I attributed my long life to the use of wines and liquors. Except when in Paris in 1894, when, at the suggestion of a French physician, I drank wine at the banquets tendered the delegates to the International Sanitary Conference, of which I was a member, I never before nor since used wines nor liquors. I do not believe that alcoholic stimulants should be used except as a medicine, and then prescribed by a physician.

I shall be glad if you will contradict these statements as printed, as you have opportunity, and I shall appreciate your coöperation.

STEPHEN SMITH.

✚

A Dangerous Practice

TO THE EDITOR:

Please permit me to call the attention of your readers to the dangerous practice of throwing boards down with nails sticking from them, and leaving them lying around, a constant danger to barefoot children or anyone with worn thin shoe soles.

This is a very common habit and causes many deaths from tetanus or lockjaw where not attended to promptly and skillfully. *BETTER BE SAFE THAN SORRY.*

A. L. POTTER,
Independence, Kansas.

ASSOCIATION NEWS

LIST OF NEW MEMBERS

Proposed for election to the A. P. H. A. April 1 to April 30, inclusive.
Names of Sponsors are set in **Bold Face Type.**
Names of New Members are set in Light Face Type.

MAINE

Dr. Clarence Kendall, Augusta, Maine.
Herbert Luther Lombard, M. D., Presque Isle, Maine, District Health Officer.

KANSAS

Harold B. Wood, M. D., Dodge City, Kansas.
J. E. Hawley, M. D., Burr Oak, Kansas.

TEXAS

Mr. A. W. Hedrich, New York, N. Y.
J. B. Florence, M. D., State Board of Health, Austin, Texas. President State Board of Health and State Health Officer.

EMPLOYMENT BUREAU

HELP WANTED

Help wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the 8th of each month for publication on the 20th. Mail to New York office as early as possible.

In answering keyed advertisements, please mail replies separately to editorial office in New York City. In replying give age, professional training, salary requirements, previous positions held and three or more references.

Wanted: Assistant in bacteriology and public health in middle western university of more than 5,000 students. Salary $2,500. Position open not later than September 1st. Address R. P. M. 483, care of this JOURNAL, New York address.

Wanted: Bacteriologist, male, for position in hospital laboratory. Capacity 800 beds. In large city of Central West. Salary $2,400. Two weeks' vacation with full pay after one year's service. Address S. C. 482, care of this JOURNAL, New York address.

Wanted: National field organizer. Write qualifications as to education, training, experience, public speaking, organization and health propaganda. Salary, $5,000 to $6,000. Address American Society for Control of Cancer, 370 Seventh Avenue, New York City.

Notice of Examination for Entrance Into the Regular Corps of the United States Public Health Service

Examinations of candidates for entrance into the Regular Corps of the U. S. Public Health Service will be held at the following named places on the dates specified:

At Washington, D. C.....June 12, 1922

At San Francisco, Cal.....June 12, 1922

Candidates must be not less than twenty-three nor more than thirty-two years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily, oral, written and clinical tests before a board of medical officers and undergo a physical examination.

Successful candidates will be recommended for appointment by the President with the advice and consent of the Senate.

Requests for information or permission to take this examination should be addressed to the Surgeon General, U. S. Public Health Service, Washington, D. C.

H. S. CUMMING, Surgeon General.

Wanted: Director of state health department laboratory with appropriation of $12,000 per annum. Director has full and free control under State Board of Health. Present salary $3,000, but application will be made to legislature for increase. Address State Board of Health, Indianapolis, Ind.

Wanted: Graduate nurse, who has had training in contagious disease work, capable of taking charge of a forty bed municipal contagious disease hospital. Salary, $125, with board, room and laundry. Address Dr. W. W. Johnston, Health Commissioner, Racine, Wis.

Wanted: Laboratory technician, familiar with milk testing. Health Department, City of Joplin, Mo.

POSITIONS WANTED

Positions wanted announcements will be carried in this column. The charge is $2 per insertion. Copy should be received at this office by the 8th of the month.

Wanted: Experienced bacteriologist, B. S., Ph. G., C. P. H. degrees, age 31, married, Protestant, capable of handling and directing bacteriological, serological and chemical work pertaining to public-health control. Would consider a position with state or municipal laboratory. Southern states preferred, but other sections considered. Salary expected $3,000 per year. Address M. R. M. 209, care of this JOURNAL, New York address.

Wanted: Position as director or assistant director of public-health laboratory or instructional position in biochemical department of recognized university by man, age 28, with seven years' experience in teaching, army laboratory, and public-health laboratory work. Large initial salary not so much desired as congenial working conditions and chance for advancement. Can furnish best of references. Address V. E. 205, care of this JOURNAL, New York address.

Wanted: Sanitarian and malaria control expert wishes to make a change. At present has charge of one of the largest malaria control jobs in the South. During the season of 1920 kept the malaria in the district to a 10 per cent increase, while the ouside districts increased 400 per cent. Is a competent executive, can handle men and can get results. Address Harrott 212, care of this Journal, New York address.

Wanted: County health work by trained and experienced health worker, six years in county work. First class references. Address W. H. 206, care of this JOURNAL, New York address.

Wanted: Position by a graduate in medicine and public health, experienced in all phases of health work, county, state and municipal, including administrative and educational work. Best of references furnished. Address L. W. 207, care of this JOURNAL, New York address.

Wanted: Position by a graduate in medicine and public health; eight years experience as bacteriologist, city and county health officer, vital statistician, general medical practice, professor of hygiene and university physician. No salary less than $3,000 considered. First class references. Address K. T., care of this Journal, New York address.

Wanted: Position as director or assistant director of public-health laboratory or instructional position in bacteriological department of recognized college or university by man, age 26, with M. S. degree and six years experience in teaching, army laboratory and public-health laboratory work. Can furnish best of references. Address J. M. 214, care of this Journal, New York address.

Wanted: Better position as municipal health officer by successful commissioner in southern town of 8,000. Graduate of northern Class A. medical school; married; 48 years old. Prominent in mosquito eradication work. Experienced in food inspection and health legislation. Salary required $2,700 and expenses. Address B. H. P., 210, care of this JOURNAL, New York address.

Wanted: Public health executive desires a change. Has charge of the bureaus of food, milk and laboratories in a city whose health department is rated high by the United States Public Health Service. Is a competent chemist and bacteriologist; has the executive ability to control a large laboratory, and has a good working knowledge of the relation and application of the theories of vital statistics to public health. Is thoroughly grounded in the philosophy of public-health work. Has the energy, ingenuity and ability to develop a public health department that will give maximum return on a minimum investment. Address Meredith 213, care of this Journal, New York address.

BOOKS AND REPORTS REVIEWED

Obstetrical Nursing. *Carolyn Conant Van Blarcom. New York: Macmillan Company,* 1922. *Price* $3.00.

The preface describes concisely the scope of the book and at the same time indicates its unique value. It is well known to all nurses who have done obstetrical nursing, for other than one doctor, that there is tremendous difference of opinion among obstetricians as to the best method to be used in practically every condition treated, with the result that nurses trained in a school where one method is followed are not always qualified to give the most understanding help to an obstetrician who employs another method of treatment. There has been a distinct need for a book which would give, as does this one, "parallel descriptions of dissimilar nursing procedures," and which would bring out at the same time the fact that methods unfamiliar to a nurse trained under the guidance of one particular obstetrician may be quite as efficacious as those in which she has become expert. As well as giving these dissimilar nursing procedures for the same condition Miss Van Blarcom gives clearly the cause of the condition and the purpose for which the nursing procedure is prescribed. Such a book cannot fail to increase the nurse's understanding and thereby improve her work.

Furthermore, the book is eminently readable. One feels not at all as though reading that abhorred thing, a textbook, but rather enjoying a rare treat such as when one takes times from work for a particularly pleasant half day's reading. The book is infinitely more than a textbook. It emphasizes constantly the opportunities and privileges, as well as the responsibilities, of obstetrical nursing.

The illustrations add greatly to the value of the book. A nurse who merely looks at the illustrations with their particularly clear captions would add much to her knowledge of, and interest in, obstetrics.

It so clearly meets a need which has been keenly felt by all who have either done or taught obstetrical nursing that it is difficult to discuss it without seeming extravagance. Undoubtedly there are points which may be considered controversial, but the book so far supersedes other books on obstetrics for nurses that these are lost sight of in the general excellencies. No nurse confronted with the serious and difficult problems of obstetrical nursing need feel unprepared if she has made herself familiar with the teachings of this book. Public-health nurses will find much help within its pages, for it is written from the standpoint of obstetrical nursing in the home rather than obstetrical nursing in the hospital.

ANNE A. STEVENS, R. N.

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Plumbing Fixture Traps. *A. E. Hansen. New York: Privately published,* 1921. *Pp.* 83. *Price,* $2.00.

There is no doubt that a great difference of opinion exists as to the efficiency of anti-siphon traps or the extent to which they may be safely used. Ignorance of the scientific principles involved is largely responsible. The author of *Plumbing Fixture Traps,* by giving the historical review of the efforts to develop a satisfactory anti-siphon trap and discussing, even though it is from a biased standpoint, the tests of the devices offered at various times, has rendered a real service in the investigation of a problem that should have thorough study.

It is unfortunate that the author should assume that a desire to find a trap that would meet the conditions of service, disqualifies an inventor as a judge of performance. To discredit work of this kind is to discourage development. If anything can be evolved that would cut down the cost of installation, even to the extent of a few dollars, only in the small residence for one or two families, it should be encouraged. What is needed at this time is reliable information as to the proper limitations in the use of such devices that may be developed.

It is in equipments of a more or less extended character that doubt exists at present as to the performance of anti-siphon traps. The author does not discuss their use in the small house, which, after all, is the great issue, and the one that most af-

fects the general public. In 1920 over 40 per cent in number and value of the buildings for which permits issued in 131 cities of over 25,000 population, in the United States, were one and two family residences. If the total number of such homes in all cities, villages and suburbs, where plumbing is used, could be determined, it would no doubt run up to 75 per cent or more of all buildings having plumbing equipments.

A careful perusal of the book under consideration will be of great assistance to any one interested in the solution of the problem.

RUDOLPH P. MILLER.

"CHILD HEALTH IN ERIE COUNTY, NEW YORK"

a cooperative inquiry by seven national and two state organizations into conditions affecting child health in the rural sections and villages. 20 cents, postpaid.

NATIONAL CHILD HEALTH COUNCIL
Washington, D. C. Advt.

A LIST OF BIBLIOGRAPHIES ON HEALTH SUBJECTS

COMPILED BY JAMES A. TOBEY

In order that sanitarians may know where to find lists of books and pamphlets on various health subjects, this particular list has been compiled. It is a bibliography of health bibliographies and contains references to all the available, up-to-date compilations of references that we have been able to locate. It will be appreciated if omissions are brought to our attention.

1. *Child Care.*

Annotated Subject Index and Order List of Books and Pamphlets, Including Government Reports, on Maternity and Child Welfare in England and Scotland. August, 1920. American Red Cross, Washington, D. C.

Bibliography of the Education and Care of Crippled Children. 1st Edition, New York. D. C. McMurtrie, 1913. 99 pp.

Bibliography on the Care and Feeding of Infants and Children. 1921. Bureau of Child Hygiene, New Jersey State Department of Health, Trenton, New Jersey. (Reprinted from data of Massachusetts State Department of Health.)

Bulletins in Foreign Languages. (A List.) U. S. Children's Bureau, Washington, D. C.

Child Welfare. Selected List of Books for Parents. 1919. Federation for Child Study, New York.

Mother and Child. Monthly magazine of the American Child Hygiene Association, Washington, D. C., has a bibliography in each issue.

American Medical Association. Council on Health and Public Instruction. Child Welfare; selected list of books and pamphlets compiled by E. L. Bascom and D. R. Mendenhall. 40 p. Chicago, The Assn. 1918.

Iowa. State University of Iowa. Child Welfare Survey and Bibliography. (Extension bulletin, No. 16, 1916.)

Munro, W. B. Bibliography of Municipal Government in the United States. Cambridge, Harvard University, 1915. Poor Relief and Child Welfare, p. 367-70.

Russell Sage Foundation. Library. Child Welfare in War-time. (Bulletin No. 30, 1918.)

2. *Clean Up Campaigns,* List of References to. Municipal Reference Library, Chicago, Ill.

3. *Eugenics.*

New York (State). State Board of Charities. Bureau of Analysis and Investigation. Bibliography of Eugenics and Related Subjects. 130 p. Albany, The Board, 1913. (Eugenics and Social Welfare Bulletin No. 3.) Includes sections on feeble-mindedness and sex hygiene.

4. *Health Center* Bibliography. April, 1921. American Red Cross, Washington, D. C.

5. *Health, General.*

Annotated Bibliography on Eyesight and Lighting (In preparation). Mrs. L. D. Goldsbury. The Eyesight Conservation Council of America, Inc. Times Building, New York.

Community Health Bibliography. February, 1921. Russell Sage Foundation, New York.

Foreign Language Bulletins, List of. (Includes Health and Child Welfare.) June, 1921. Young Women's Christian Association, New York.

Guides to Health. Selected List of Pamphlets on Health for Distribution by Red Cross Health Centers. May, 1921. American Red Cross, Washington, D. C.

Guide Posts on the Road to Health. A list of Books. By S. L. Halliday. April, 1919. Municipal Reference Library, New York.

Health (Supplemental to above) April, 1921. Municipal Reference Library, New York.

Health; Diseases, Drugs, and Sanitation. List of publications for sale by Superintendent of Documents, August, 1921, Washington, D. C.

Health Officers, Bibliography for. New York State Department of Health, Albany, New York.

Health Quotations. Compiled by James A. Tobey, August, 1920. American Public Health Association, New York.

List of Books on the Prevention of Disease, compiled by the Medical Literature Committee of the Committee on Public Health Education among Women, American Medical Association. Chicago, Illinois.

Some Good Books on Community Health, Health Library of the Common Service Committee, National Health Council, New York.

Suggested List of Books on Hygiene for the Town Library. By H. L. Wedgwood. The Commonhealth. Jan.-Feb., 1920. Massachusetts Department of Public Health, Boston, Mass.

California. Health, State Board of. Bureau of Registration of Nurses. Annotated List of Text and Reference books for schools of nursing. 53 p. Sacramento, The Board, 1916.

Munro, W. B. Bibliography of Municipal Government in the United States. 472 p. Cambridge, Harvard Univ. 1915. Sanitation and Public Health, p. 228-298.

Smith, A. W. Selected Bibliography of Sanitary Science and Allied Subjects, 37 p. Boulder, Colo. Greenman, 1919. (Prepared with reference to the needs of students pursuing the course in sanitary science in the College of Liberal Arts, University of Colo.)

6. *Hookworm* Bibliography. 1922. International Health Board, New York.

7. *Industrial Hygiene.* See A List of Bibliographies on Industrial Engineering and Management. May, 1920. Society of Industrial Engineers, New York.

Russell Sage Foundation. Library. Industrial hygiene; a selected bibliography. (Bulletin No. 36, 1919.)

8. *Legislation.* Bibliography of References to Health Legislation. By James A. Tobey. Reprint 684, Public Health Reports (August, 1921). U. S. Public Health Service, Washington, D. C.

9. *Mental Hygiene.*

Bibliography of Feeble-Mindedness in its Social Aspects. Crafts, Leland Whitney. Faribault, Minnesota. Minnesota School for Feeble-Minded and Colony for Epileptics, 1917. 73 pp. Journal of Psycho-Asthenics. Monograph supplements, V. 1. No. 3, March, 1917.

Bibliography of Feeble-Mindedness in Relation to Juvenile Delinquency. Whittier, California. Crafts, Leland Whitney. Boys' Printing Instruction Department, Whittier State School, 1916. p. 195-208. Reprinted from Journal of Delinquency, 1, No. 4, September, 1916.

Feeblemindedness. A Selected Bibliography. February, 1916. Russell Sage Foundation, New York.

Publications Distributed by the National Committee for Mental Hygiene, List of. January, 1920. New York.

National Committee for Mental Hygiene. War Work Committee. Neuropsychiatry and the War, a bibliography prepared by M. W. Brown, edited by F. E. Williams.

10. *Moving Pictures* (Health).

Municipal Reference Library, New York, List. June, 1918.

National Board of Review of Motion Pictures, New York, September, 1920. List.

National Tuberculosis Association Bulletin, New York. February, 1921. List.

New York County Chapter, American Red Cross, New York. List (not for distribution).

U. S. Bureau of Education, Washington, D. C. 1922. List.

11. *Nutrition.*

Bibliography of Investigations Bearing on the Composition and Nutritive Value of Corn and Corn Products. Issued in mimeograph form by the National Research Council, Washington, D. C., 1920. 198 pp. Keith, Mary Helen.

Bibliography of School Lunches. U. S. Bureau of Education, Washington, D. C.

Foods and Cooking. List of Publications for sale by Superintendent of Documents, August, 1920. Washington, D. C.

Lunch Hour at School (Health Education No. 7). U. S. Bureau of Education, Washington, D. C. 1920. Contains bibliography.

Nutrition Bibliography. Prepared by New York Nutrition Council. June, 1921. New York County Chapter, American Red Cross, New York.

Nutrition Bibliography. Mother and Child Magazine, July, 1921. Baltimore, Md.

12. *Physicial Education.*

Bibliography on Educational Hygiene and Physical Education. T. D. Wood and M. Reesor, Teachers College, Columbia University. New York.

Book List of the American Physical Education Association, Springfield, Mass.

Selected Bibliography of Physical Training and Hygiene. 1910. Brattleboro, Vermont, 1911. Author has a constantly recurrent bibliography in American Physical Education Review.

Russell Sage Foundation. Department of Recreation. Sources of Information on Play and Recreation (revised and enlarged edition, 1920), by H. R. Knight and M. P. Williams. 48 p. 1920. Physical Training and Gymnasia, p. 12-14.

Selected Bibliography of Physical Training and Hygiene. (In American Physical Education Review V. 22, Jan.-Aug., 1918.)

13. *Public Health Nursing.*

Bibliography for Public Health Nurses. New York State Department of Health, Albany, New York.

Reading Lists on Organization, Administration and Development of Public Health Nursing, New York. October, 1920. National Organization for Public Health Nursing. New York.

14. *School Hygiene.*

Annotated Bibliography of Medical Inspection and Health Supervision of School Children in the United States, 1909-1912. U. S. Bureau of Education, Washington, D. C.

Annotated Bibliography on School Feeding. Bryant, Louise Stevens. In "School Feeding" by same author. Philadelphia, Pa., 1913. p. 261-97.

Bibliography on the Posture of School Children. Bancroft, Jessie Hubbell. In "The Posture of School Children" by same author, New York. MacMillan Company. 1913. p. 309-22.

Books on Health as Related to the School Child. March, 1921. New York State Library, Albany, New York.

Suggestions for a Program for Health Teaching in the Elementary Schools. (Health Education No. 10) U. S. Bureau of Education, Washington, D. C., 1921. Contains bibliography.

Pierce, A. E. comp. Catalog of literature for advisors of young women and girls. 85 p. N. Y. Wilson, 1921. Section on School Hygiene, p. 29-32, includes references on: Care of body, Health of students, Physical education, Posture, and Recreation.

15. *Social Hygiene.*

Books on Sex Education, U. S. Public Health Service, Washington, D. C.

What to Read on Social Hygiene. 1920. American Social Hygiene Association, New York.

List of Publications, 1922. American Social Hygiene Association, New York.

16. *Surveys.*

Bibliography of Health Surveys, Cleveland, Ohio. Hospital and Health Survey. Part two.

Bibliography on Public Health Surveys. In "Public Health Surveys" by Horwood, Murray Philip. New York, John Wiley & Sons, Inc., 1921. p. 371-84.

Social Survey, December, 1915. Russell Sage Foundation, New York.

17. *Tuberculosis.*

Tuberculosis. A Selected Bibliography. August, 1916. Russell Sage Foundation, New York.

Tuberculosis. A Selected List, compiled for the use of physicians, nurses, patients, librarians, and others. National Tuberculosis Association. June, 1921, 3 p.

PUBLIC HEALTH NOTES

Abstracts by D. Greene, M. D., James A. Tobey and Homer N. Calver.

National Negro Health Week.—This year's Negro Health Week, the eighth held, was conducted by Dr. R. R. Moton, of Tuskegee Institute, April 2-8, under the auspices of the Annual Tuskegee Negro Conference and the National Negro Business League, and in coöperation with the U. S. Public Health Service, national and state tuberculosis societies, the Red Cross, American Social Hygiene Association, and many other organizations.

The purpose was to reduce morbidity and mortality among Negroes by educational methods, with particular emphasis on tuberculosis, infant mortality and venereal diseases. Lectures were given, films shown, and exhibits held in public schools, theaters, churches, libraries and among Negro employees at their work. Negro doctors and nurses were used for these lectures. Radio broadcasts, sent from Washington under the U. S. Public Health Service, reached about 350,000 people.

Among other points brought out was the fact that many deaths could be avoided by observances of more sanitary conditions, that in New York City alone the death-rate of Negroes was 70 per cent higher than that of white persons, but that during the last eight years this had been reduced 9 per cent.

A special feature of this year's observance was the setting aside of each day of the week for a special subject, as follows: Monday, venereal disease control measures; Tuesday, extermination of flies, mosquitoes, and all disease-carrying insects; Wednesday, children's day, with stories of health crusades and covering a celebration of the birthday of the late Booker Washington; Thursday, tuberculosis day, with special attention given to impressing the fact that tuberculosis is not hereditary; Friday, church sanitation; and finally Saturday as a general clean-up day.

✚

Inefficiency in Public Health Administration.—During the late war, efficiency was everywhere demanded. It thrilled the nation for a time, but the excessive use of the word soon made it a by-word, and a few months of overaction was followed by relaxation and inefficiency. This is true of public-health work, for in some localities it has declined to a deplorable degree. Ignorance, as well as indifference, on the part of the public hinders the health administration, and to create active interest in sanitation and preventive medicine should be the aim of all health workers. Being deficient in knowledge of sanitation and unwilling to acknowledge its benefits, the members of local boards often become obstructionists to public-health measures. The stimulus of a fee might induce better attendance at board meetings and create better interest. Many boards are so inefficient that it is believed in some cases that a single health commissioner with full authority in matters affecting the public health would be more effective.

A uniform system for all third-class cities should be enacted by the legislature, with a per capita rate of 50 to 75c for public health provided by law. The health commissioner of a third-class city should give full time, receive not less than $3,000 a year and expenses, and have power to appoint necessary assistants. His term of office should not be less than five years.

To illustrate how ignorance may be the cause of many deaths, it was the belief in one community that measles cannot be effectively controlled, and that sooner or later every one must have the disease. In this locality there were twenty-two deaths from this cause which might have been prevented. In one instance where a health officer was vigilant, an epidemic of measles was prevented, though it was carried to his district seven different times within a year. If measles produced the fear that hydrophobia and smallpox do, they would rarely be seen and epidemics would never occur. Considerable inefficiency in health control work is due to failure of physicians to live up to the rules of the sanitary code, but often failure to report communicable diseases when no physician is in attendance is the cause of the spread of these diseases.

Insufficient funds for proper conduct of health affairs may be the cause of inefficiency in one municipality, while in another

it may arise from deficient help. There are many causes, but the greatest is lack of interest by health officials. In a sense, many health officers are merely accidents of our political system, appointed without regard to qualifications.—A. M. Hall, M. D., Fulton, N. Y., *Journal of the American Medical Association*, March 11, 1922, Vol. 78, pp. 726-728.

✣

The Philosophy of Occupation Therapy.—Based upon his personal experience, the author shows the value of work as a sovereign help in the problem of adaptation, and shows that the culminating feature of evolution is man's capacity of imagination and a use of time with foresight, based on a corresponding appreciation of past and present.

Many formidable diseases are largely problems of adaptation. The whole of human organization has its shape in a kind of rhythm, and it is necessary that our organism be attuned to all of the rhythms, such as night, day, hunger and its gratification, work, play, rest and sleep, and be able to attain balance even under difficulty. Thus, the twenty-four hours of the day are the problem of nursing and the immediate therapy, and the employment of time has become an important measure and problem for the physician and nurse.

It is the use we make of ourselves that gives the ultimate stamp to our every organ, rather than our mere good-will and good intention. Hence, in mental diseases it becomes the task to obtain performance wherever it fails to come spontaneously. Hence, too, the preëminent rôle of the nurse and the director of occupation and recreation in the treatment of all conditions where the mental factors play a rôle.—Adolph Meyer. *Archives of Occupational Therapy*, Vol. 1, No. 1, February, 1922.

✣

The Division of School Hygiene.—This Division was created in the United States Bureau of Education of the Interior Department by an order of the Commissioner of Education, P. P. Claxton, date October 19, 1912. This order was made possbile by the provision in the Appropriation Act of 1911-12. The scope and purposes of this Division are:

1. To furnish to all who seek it information regarding the sanitary construction of school buildings.
2. To bring together at the Bureau information relating to school hygiene and sanitation and to render this information accessible to school authorities and all others interested.
3. To gather and prepare for publication information concerning the hygienic condition of school buildings and grounds throughout the country.
4. To conduct all correspondence referred to it wherein advice and information are sought on matters of school hygiene and school sanitation.
5. To prepare bulletins on such special topics as the commissioner may from time to time direct.
6. To direct such coöperative investigations as shall be made in connection with the Bureau on matters relating to the hygiene of the school children.
7. To compile and send out bibliographies on special topics in school hygiene, school sanitation, and medical inspection.
8. To assist in any work connected with the Bureau which the commissioner may see fit to assign to the Division.

The work undertaken consisted of answering correspondence (in one year there were 11,475 letters received), giving out information, preparing exhibits, the preparation for lending purposes of cardboard models of three types of school houses, helping the survey of rural schools, sending out bulletins on open-air schools, etc. An annual conference on physical education has been held under the auspices of the Division. For several years, beginning in the late fall of 1918, the Bureau has had the active assistance of the Child Health Organization of America.

There is now pending before Congress a bill which would greatly increase the scope of the work of the Bureau of Education, probably through this Division. The purpose of the bill (the so-called Fess-Capper Physical Education Bill) is to provide for the promotion of physical education in the United States through coöperation with the states in the preparation and payment of supervisors and teachers of physical education, including health supervisors and school nurses. An appropriation would be made the United States Public Health Service to carry out research and demonstration work.

The total appropriations to the Division

of School Hygiene, through the Bureau of Education, have never been large, and the largest personnel was in 1919 when there were five members of the staff including two special collaborators not paid out of Bureau funds. The Division has always attempted to coöperate with other organizations interested in school sanitation, physical education, educational hygiene and general health education.—Report of the National Health Council, by James A. Tobey, *School and Society*, March 25, 1922, Vol. XV, No. 378.

✣

The Food Research Institute of Stanford University, which grew out of a suggestion by Herbert Hoover, and was founded in February, 1921, by the Carnegie Corporation of New York in conjunction with the trustees of Leland Stanford Junior University, is organized for the purpose of intensive scientific study of food production, distribution, and consumption.

The following directors were appointed in April, 1921: Carl L. Alsberg, M. D., Joseph S. Davis, Ph. D., and Alonzo E. Taylor, M. D. An advisory committee was also appointed.

During the Great War it was first realized that it was important for governments to have information regarding food production, distribution, nutrition and dietetics. In the crisis it was found that the necessary statistics were not available without extensive work in collection. The founders of the Institute are convinced that scientific study of these problems is important in peace as well as war time, and that while government research will continue, the work of a non-governmental organization with university affiliations could be of advantage without the limitations which apply to these agencies.

In the course of its activity the Institute will concern itself with such subjects as the food elements in actual and normal standards of living, physiological and social aspects of sub-nutrition, as well as the production and marketing of foodstuffs. It will be the policy of the Institute to avoid overlapping of the work of established research organizations, public or private, and to enlist the aid of such organizations in the prosecution of researches. In fact, it is the hope that methods developed by the Institute may be utilized by other agencies in similar investigations.

The work will be done mostly at the University. The Institute is organized as an integral part of the University with the status of a department, for the purpose of directing research and recommending degrees. For the year 1922-23 it has established four fellowships for graduate study in the field of food research.

The first year has been largely occupied with the establishment at Stanford, the determination of general policies, the organization of a small staff, the collection of data which will be required for research, etc., but the work is expected to be well under way by the autumn of 1922.

The results of researches will be published through established technical journals, or when this is undesirable, in a series of publications to be issued by the Food Research Institute.—Statement by Stanford University, California, March 20, 1922.

✣

Intravenous Use of Quinine in Malaria.—When quinine is given intravenously by routine in malaria treatment it can hardly be claimed that the procedure is without danger. The sudden introduction of a concentrated solution into the blood stream tends to cause circulatory depression and distressing nervous phenomena. Accidental extravasation into the tissues at the point of injection is apt to cause local necrosis and sloughing. Against these dangers is the unquestionable rapidity with which the drug is brought into contact with the parasites in the blood stream. Except for this there is no clear evidence at present that in ordinary malaria infections the method is more effective than mouth administration in curing an acute attack, in ridding the blood of sexual forms, or in preventing relapse.

Its proper field of usefulness seems to be upon urgent clinical indications of two sorts: first, in cases in which prompt absorption by the gastro-intestinal tract, following mouth administration, is not to be expected because of violent gastro-intestinal disturbance or other cause, or in which it is impossible to give the drug by mouth on account of delirium, coma, etc.; and second, in cases which are gravely ill when first seen by the physician and in whom it is deemed imperative to secure immediate synchonization. It does not seem necessary nor desirable to use the intravenous route of administration in the simple acute or chronic infections or-

dinarily encountered, whether tertian or æstivo-autumnal.

When the clinician decides that the method is warranted, the effect upon the patient must be borne in mind. Particularly is it necessary to be sure that the patient is not already suffering from circulatory embarrassment. The technique of the injection must be such as to minimize the danger of untoward effects by observing three cardinal principles: careful aseptic technique; giving the drug in moderate doses and in dilution; and introducing the solution slowly.

All the precautions which are observed in giving a dose of salvarsan should be observed in giving quinine.—Dr. K. F. Maxcy, *U. S. Public Health Service Health News.*

✚

Good Water Polluted by Bad Handling.—Certified water of satisfactory quality may be so handled in its delivery and storage aboard a vessel as to render it unsafe for consumption. On the Ohio and Mississippi Rivers, for instance, in many places drinking water is carried in pails, barrels and kegs, where there are no hydrants at the docks, with the result that water otherwise perfectly good becomes contaminated and impure. There should be hydrants on or near all wharves carrying public water supplies, so that a hose may be attached and water carried directly on board boats. The hose should be carefully protected from contamination from the river water and other sources, and used for no other purpose. Where the river level is subject to marked changes a water pipe could be run down the incline of the landing; city hydrants, properly protected, should be placed on it at about each 15 feet of vertical rise in the landing. Preliminary steps are now being taken to do this at Louisville, Cincinnati, Evansville, Huntington, and Pittsburgh.

✚

Sanitation in Public Buildings as a Health Factor.—Sanitary surroundings largely determine the healthfulness of a locality, and the public buildings of a community are important factors in determining the well-being of its people. Since practically all children between the ages of 7 and 14 attend school, it is a public duty to secure surroundings that are conducive to their well-being physically, mentally and morally. Sunshine, fresh air, pure drinking water, cleanliness, proper toilet-room facilities, and good sewerage are all essential.

A hotel is often the measure by which a whole town is judged. Hotel sanitation is a problem that the health authorities must handle, but the citizens of every city should agitate it until any necessary reforms are brought about. There must be rigid enforcement of the laws of sanitation, which are, after all, the laws of common sense and of common cleanliness.

Hospitals, too, offer problems in municipal sanitation. Absolute cleanliness is one of the prime requisites here. Court houses and jails are nearly always unsanitary, and are often remarkable for their filthiness. The remedies are obvious.

Civic pride is a great aid to the healthfulness of a community, and if public buildings are not sanitary they can be neither healthful nor beautiful. Coöperation of citizens in the clean-up of such buildings is all that is necessary.—Manton M. Carrick, M. D., *The Nation's Health,* Vol. IV, No. 2, February, 1922.

✚

Dr. Hoffman Goes to Babson's.—Dr. Frederick L. Hoffman, third vice-president and statistician of the Prudential Insurance Company, has become dean of the Graduate School of Business Administration at Babson Institute, Wellesley Hills, Mass. He will take up his new work May 1, but will retain his connections with the Prudential. The Graduate School of Business Administration is a new feature of the Babson Institute, and the first of a series of new buildings to house it will be ready in the fall. The teaching methods will be highly individualized to fit young men for executive responsibilities in the conduct of large corporation undertakings. Dr. Hoffman has recently returned from South America where he made extensive investigations into tropical mortality.

✚

Lengthening Life through Insurance Health Work.—At the end of thirteen years of effort to lengthen the lives of its industrial policy-holders, whose mortality had previously been uniformly higher than in the general population, the Metropolitan Life Insurance Company is able to announce a gratifying improvement in its mortality experience. This has been accomplished by

four main lines of work: education of policy-holders in personal hygiene by the distribution of 238,877,506 pamphlets; organizing a visiting nursing service to care for policy-holders when ill, which has made a total of 13,802,906 visits; an industrial service bureau to coöperate with employers in improving working conditions; and coöperation with health and other officials in securing legislation and appropriations.

Omitting the peak year of the influenza epidemic in 1918, which affected adversely the majority of other specific death-rates, the graphs shown by the Metropolitan, trended by straight lines for the period 1911-1921, show a downward tendency in the Metropolitan experience exceeding that of the United States Registration Area for all causes of death, mortality of children (1 to 14 years), tuberculosis (all forms), diseases of the heart, chronic nephritis, accidents, typhoid fever, and puerperal septicemia. Only the curves for influenza and pneumonia, cancer, and all diseases and conditions of the puerperal state show increases, and in these the Metropolitan upward tendency is less than that of the Registration Area.

✣

Medical Journals Consolidated.—The final issue of the *Medical Record* as a separate publication appeared on April 22 and announcement was made that the *Medical Record* had been sold to, and combined with, the *New York Medical Journal*, which appears semi-monthly.

Throughout the fifty-six years of its service to the profession, the *Medical Record* has had the same publishers and but two editors. Dr. George F. Shrady guided its course for the first thirty-eight years and was succeeded by his assistant, Dr. Thomas L. Stedman, who has long been dean of American medical editors, and widely esteemed.

Many of the most important discoveries and developments in the progress of preventive medicine were first announced to the American profession by the *Medical Record*. These include Lister's method of antisepsis; Koch's discovery of the tubercle bacillus and that of tuberculin; the employment of cocaine in eye surgery; the Roentgen rays; the discovery of the antitoxin of tetanus and that of diphtheria; Madame Curie's discovery of radium and many others.

The Germicidal Influence of Sunlight.—That the rays of the sun are active in the destruction of germs is no new idea. This is why animal life is possible in the tropics, where germs grow with such rapidity that were it not for the great activity of the intense sunlight they would soon overwhelm everything. Recent experiments made by Laroquette, at Algiers, indicate that the luminous rays of the sun, that is, ordinary white sunlight, do much more to destroy germs than any individual group of rays. The so-called violet rays, formerly supposed to be the most active, are now known to be less active than the luminous ray.—*Good Health*, October, 1921. p. 444.

✣

Finnish Child Welfare League.—"General Mannerheim's League for Child Welfare" is the title of a Finnish organization founded in 1920 by the former regent of Finland. It is national in scope and aims "by the promotion of voluntary effort in the sphere of child welfare to foster the healthy development, bodily and mentally, of the coming race, in so far as the work is not undertaken by state or local authorities or by special enactments."

Its membership already includes more than 12,000 individuals, while over 30 already existing local or national societies have been admitted as sections. The League is working on three main lines of action: hygienic, moral, and informative. It contemplates the establishment of maternity and child welfare centers, courses for nurses and midwives, recreation clubs, day homes, a central library and information bureau. Although it has as yet no large positive results to show, great interest has been shown in its projects among all classes, and it is expected to do a great and beneficial work for Finland.

✣

Hygiene in the Arctic Regions.—Vilhjalmur Stefansson, in the *Journal of the American Medical Association*, makes special reference to the early age of maturity in the Eskimos, in contradiction to the generally accepted idea that peoples in tropic climates mature sooner. This he ascribes to the fact that the Eskimo houses are kept up to a temperature of 100°, or nearly that, during the whole winter, so that the people never feel the extreme cold on their bodies, being kept constantly heated so that they perspire

freely. When they go out of their houses they are protected by several layers of fur clothing, and the face is the only part of their anatomy exposed.

Women generally mature to child-bearing age at 10 to 13 years. Sometimes they stay indoors the whole winter through, and so are in the same position physically as the women of Italy or any southern country. To all intents and purposes the typical Eskimo lives under tropical or subtropical conditions, and it matters not what the temperature may be out of doors.—*Good Health*, December, 1921, Pp. 513-514.

✚

Far-sighted Economy.—The administration, in England and Wales, while pursuing a program of economy, has spared the bough on which the babies' cradle rests. Navy, Army, Air Forces, Police, and even Education, will have to satisfy Parliament, if they can, that the economies suggested are unjustified, but the appropriations for maternity and child welfare services continue undiminished. Under the presidency of Lord Astor, a public conference was held which passed a resolution to the following effect:—

"That in view of the fact that national expenditure on public health (apart from housing) is relatively small, while the actual results in the saving of life—in increased longevity and in improved physical capacity—are by comparison very large, and that money spent on public health has proved itself to be the highest form of economy: this conference, while recognizing that normal expansion must under existing circumstances be postponed, urges the government to avoid curtailment in national expenditure on public health."

The coming generation in Great Britain will not have to look back to 1922 and say, "That was the year when our fathers and mothers decided to save at our expense."—*Maternity and Child Welfare*, March, 1922. *(H. N. C.)*

✚

Physical Education Conference.—The fifth National Conference on Physical Education, held in Chicago February 28, was conducted as a joint affair with the National Council of State Departments of Education, of the National Education Association. About three hundred people were present. These conferences have come to serve the purpose of bringing to the attention of the superintendents of education the importance and significance of physical education.

✚

National Health Council Issues Report on Health Section of U. S. Bureau of Indian Affairs.—In accordance with its policy of making available to sanitarians and others impartial information on the health activities of the United States Government, the National Health Council has issued a mimeographed report on the Health Section of the U. S. Bureau of Indian Affairs. This report presents to the public for the first time a description of the important government health work among Indians. The report is the sixth of a series planned by the Council, others already published having included:

Division of Vital Statistics, U. S. Bureau of the Census.

Children's Bureau, U. S. Department of Labor.

Women's Bureau, U. S. Department of Labor.

Division of School Hygiene, U. S. Bureau of Education.

General Report of the Government Health Activities (with chart).

About a thousand copies of these five reports have already been distributed in response to special requests. A statement concerning the Division of Welfare of the Post Office Department is now in preparation. The Council calls attention to the fact that outlines of the U. S. Public Health Service and of the U. S. Bureau of Chemistry are contained in pamphlets issued by these bureaus as Reprint No. 661 from the *Public Health Reports* and Department Circular No. 137 of the Department of Agriculture, respectively. The Council does not believe that duplication of the pamphlets is necessary.

Copies of the report on the Bureau of Indian Affairs or of any of the other reports may be obtained without charge from the Washington Office of the Council, 411 Eighteenth Street, N. W., Washington, D. C.

✚

Engineering Work Reduces Mortality—Typhoid Fever Death Rate in New York State 1885-1919.—In discussing the typhoid fever death-rate for the state of New York for the period 1885 to 1919, Horton graphically emphasizes the wide variation in this rate from year to year up to 1907 and the

rather uniform decline in the curve since that year. In 1906 the Sanitary Engineering Division was established in the State Depart of Health, prior to which date there was no systematic supervision over the water supplies of the state. Horton divides this curve in two portions, 1885 to 1907 and 1907 to 1919. The average typhoid fever death-rate for the earlier period was 23.0 and for the later one 10.7 per 100,000. The 1919 rate was 3.3. As compared with the earlier period, the decline since 1907 corresponds to a saving of some 7,000 lives in 12 years.

As typhoid immunization by vaccination was resorted to only to a limited extent and milk and other food epidemics of typhoid fever were few during the 1907 to 1919 period, Horton states that the circumstantial evidence is due primarily to the engineering work of supervision of public water supplies. Tables are included giving information concerning the water supply and the typhoid fever death-rates in New York cities before and after improvements were made in the public water supplies.

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Value of Engineering Service in Public Health.—In attempting to use mortality rates to measure the effect of any engineering activity, two points should be borne in mind: (1) that there may be other sources or agents of infection responsible for the particular disease whose mortality rates are being compared than those directly associated with the particular engineering activity in question; (2) that in addition to the preventive measures carried on through any particular engineering activity, there may have been other corrective measures taken, such as immunization and medical treatment. In conclusion, Horton feels "that as a higher efficiency is attained in methods of diagnosis and in the reporting and recording of vital statistics, a truer and more accurate index will be furnished of the influence which sanitary engineering activities exert in reducing the general death-rate, and a greater appreciation given to the value of engineering services generally in the field of public-health work." Theodore Horton, Chief Engineer, New York State Department of Health. Transactions of the First Annual Conference of State Sanitary Engineers, *P. H. Bulletin*, No. 120 p, 5-15.

J. A. T.

Using Cattle to Prevent Malaria.—A writer in the *Indian Medical Gazette* for January, 1922, states that he believes that the vast majority of anophelines never feed on human beings, practically only those wishing to lay eggs and the newly hatched feeding on human beings. He believes according to his Indian experience that anopheline mosquitoes prefer cattle as feeding hosts to human beings and that the placing of cowsheds in a ring on the outskirts of a village in India with dwelling houses in the center will result in greater freedom to the inhabitants from mosquito infestation. J. A. T.

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Mortality from Typhoid Fever, 1920.—The mortality rate from typhoid fever reached its lowest point in 1920. In that year, in the registration area it was only 7.8 per 100,000 population, a decrease of 2.2 per 100,000 over 1919 and of 5.5 over 1916. The death-rate from this disease has been decreasing steadily for the last decade. The two states having the lowest rate in the registration area were Massachusetts and Wisconsin, with 2.5 per 100,000. The highest rate, 22.4, was in South Carolina. Of 33 states, only 9 show higher rates in 1920 than in 1919.—*U. S. Public Health Reports*, April 14, 1922.

(J. A. T.)

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Appraising the Sanitary Quality of a Water Supply.—The presence of pathogenic organisms in water cannot be reliably determined by a nalysis. *B. Coli* and *B. Welchii* can be detected in water, but there are no ready methods of accurately determining the number present; and those derived from human excreta cannot be distinguished from those from animals or birds. The bacilli of typhoid fever and other known water-borne diseases do not multiply in water, but decrease at an almost constant percentage rate, varying with the temperature and light and with the substances present in water. The rate of decrease is usually lower in the winter than in the summer, and under average conditions may be considered as about 20 per cent per day.

The probable age of pollution of a water, according to the author, can be determined quite as well by inspection and by hydraulic methods as by analysis. The reason given for this is that the four tests for nitrogen are considerably interfered with by growths of algæ in surface waters, and by bacterial

reduction of nitrite in ground water.—G. C. Whipple, Canadian Engineer, Feb. 28, 1922. *Public Health Engineering Abstracts,* April 8, 1922. J. A. T.

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Ship Sanitation and First Aid for Seamen.—The Secretary of Commerce has recently approved an amendment to the general rules and regulations prescribed by the Board of Supervising Inspectors, which requires that no candidate for original license as master, mate, pilot, or engineer shall be examined unless he has completed a course of instruction in "first aid" approved by the United State Public Health Service and has passed an oral examination based on a Manual on Ship Sanitation and First Aid recently prepared by the Public Health Service in coöperation with the Seamen's Church Institute, of New York City.

The manual is intended primarily to furnish officers and men of the American merchant marine a simple but comprehensive textbook on ship sanitation and hygiene, an outline of surgical conditions that obtain on shipboard, and fundamental information regarding the treatment of disease. The information contained in the manual will be of greatest value to officers and men of vessels that do not carry a ship's doctor and lack facilities for the care of the sick and injured.—*Public Health Reports,* March 31, 1922. J. A. T.

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Sewage and Sewerage of Farm Homes.—The Bureau of Public Roads of the United States Department of Agriculture has issued a 55-page pamphlet on this subject, dated January, 1922. (*Farmers Bulletin* No. 1227.) It outlines the dangers from sewage borne diseases and describes sanitary privies, chemical closets, septic tanks, grease traps and sewerage systems. Illustrations and diagrams show details of construction. J. A. T.

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Summer Courses in Public Health.—The Massachusetts Institute of Technology offers summer instruction during the months of June, July, August and September in Engineering, Architecture, Chemistry, Biology and Public Health, Mathematics, Physics, General Studies, Entrance Subjects, etc. Through its Department of Biology and Public Health, the Institute is this year expanding still further its summer instruction in Public Health and Health Education.

For those desiring to become laboratory technicians and as preparation for more advanced studies in the public-health field, technical training in bacteriology and public-health laboratory methods is offered. The courses to be given are as follows:

1. Methods of Teaching Hygiene and Public Health in the Public Schools. Prof. C. E. Turner.
2. Personal Hygiene and Nutrition. Prof. John W. M. Bunker.
3. Sanitary Science and Public Health. Prof. S. C. Prescott, Prof. C. E. Turner.
4. Elementary Bacteriology: A Consideration of the Role of Micro-Organisms in Every-Day Life. Prof. John W. M. Bunker, Dr. M. P. Horwood.
5. Bacteriology. Dr. M. P. Horwood.
6. Public Health Laboratory Methods. Dr. Francis H. Slack.

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LEGISLATION—FEDERAL

(From bi-weekly reports of the National Health Council, March 17-April 14, 1921.)

PROGRESS ON MATTERS PREVIOUSLY CONSIDERED

H. R. 10864. Increased Hospital Facilities for Disabled Veterans.—Passed Senate, April 14. This bill, which appropriates $17,000,000 for additional hospital facilities, passed the House of Representatives March 31, 1922. The measure was adopted practically as it was reported by Chairman Langley of the Committee on Public Buildings and Grounds, with the exception of one amendment giving authority for the purchase by the government of any hospitals or institutions which belong to private individuals or corporations now caring for disabled ex-service men. On April 5, Senator Culberson of Texas presented an amendment to the bill, providing that suitable and comfortable clothing shall be given patients in all hospitals if they have not the financial means to supply their own.

H. R. 10559. Commerce and Labor (Children's Bureau).—This bill was signed by the Vice-president and by the Speaker of the House on March 22. As finally passed, the increase from $80,000 to $120,000 for the investigation of matters pertaining to the welfare of children and infant mortality was retained. The provision that not to exceed twelve persons shall be employed at the rate

of compensation of $2,000 each per annum and above that sum, is contained in the bill. Salaries under the appropriation clause for the carrying out of the Federal Maternity and Infancy Act are restricted to one at $3,600, one at $3,500, one at $3,000 and the remainder not to exceed $2,000.

H. R. 10663. Second Deficiency (Children's Bureau).—The President signed this bill on March 20. The bill carries an item of $490,000 for the Children's Bureau to carry out the provisions of the Federal Maternity and Infancy Act. Thirty-six states have now accepted the terms of this act; eight by action of the legislature, the remainder by proclamation of the governor.

H. R. 10329. Interior Department.—Included in the appropriations for the Department of the Interior are a number of items of interest to sanitarians. To the Bureau of Indian Affairs, $370,000 is allotted for the relief and care of destitute Indians and for the prevention and treatment of tuberculosis, trachoma, smallpox, and other contagious diseases. An appropriation of $50,000 is made for investigation of rural and industrial education, physical education, and school hygiene. A proviso requires that no salaries for this purpose shall be paid in excess of $3,500 per annum.

H. R. 10871. War Department.—Reported from the Committee on Appropriations, March 13. House began consideration of measure March 14, 1922. It reduces the strength of the enlisted personnel of the army from 150,000 to 115,000 and the commissioned officers from 17,000 to 11,000. Appropriations are carried for the medical department as follows:

Medical and Hospital Department	$1,000,000
Hospital Care, Canal Zone Garris'n	40,000
Army Medical Museum	7,000
Library, Surgeon General's Office	10,000
Office of Surgeon General	213,520

The bill also carries an item of $500,000 for sanitation and quarantine in the Canal Zone.

H. R. 10972; S. 3326. Salaries in the Army, Navy, and Public Health Service.—On March 21, 1922, Representative McKensie introduced this bill in the House, where it was referred to a special committee on adjustment of pay. In the Senate on March 22, 1922, a similar bill, S. 3326, was favorably reported by Senator Wadsworth, chairman of the Senate Committee on Military Affairs, and was placed upon the calendar.

S. 3300. Pension for Widow of General Gorgas.—On March 24, 1922, the Senate passed this bill, which provides for a pension of $150 a month for Marie Doughty Gorgas, widow of Major General William C. Gorgas, in special recognition of the eminent services of General Gorgas in the eradication of yellow fever from Cuba and Panama.

S. 3322, S. 3278. To Erect Building for Care of Tuberculous Pupils of District of Columbia Schools.—Both of these bills appropriate $150,000 and authorize the Commissioners of the District to erect a building to be used for the care of tuberculous pupils on a site to consist of ground already owned by the Government.

S. 1010. Punishment for Prostitution. Favorably reported from the House Committee on the Judiciary. Without amendments, the House Committee on the Judiciary has recommended the adoption of this measure which passed the Senate last February. It is an amendment to the revised statutes of the United States. It would give federal trial judges the authority to sentence a girl convicted of lewdness, prostitution, or similar offenses, to a state reformatory to be designated by the Attorney General instead of a federal prison. Previous offenders, however, are not subject to this leniency.

H. R. 10730. Agriculture Department.—This bill, which had passed the House on March 13, was favorably reported in the Senate on April 3. On April 12 the Senate agreed to an amendment increasing the appropriation for the prevention of tuberculosis in animals from $2,578,800 to $2,877,600.

H. R. 4. Revision of the Pension Laws; Provisions for Nurses. Favorably reported to the Senate by the Committee on Pensions. This measure, which passed the House on February 1, 1922, provides a pension for army nurses who served during the war with Spain and members of the Nurse Corps who served in that corps between the beginning of the war and February 2, 1901.

H. R. 10941. Post Office Cancellation Stamps for Health Expositions. Passed the House, April 3, 1922. The first of these bills passed the Senate, April 10. It permits the Indianapolis Post Office to use a special

cancelling stamp entitled "Indiana Health Exposition, May 19-27, 1922. Indianapolis, Indiana." It also allows a "Pageant of Progress Exposition, Chicago, July 29 to August 14, 1922" cancelling stamp by the Chicago post office. By the terms of this bill the Post Master General could give permission for special cancelling stamps for any health exposition not conducted for private gain or profit, which did not last more than six months.

H. R. 10926, S. 3347. To Provide Medical and Surgical Treatment for Persons Serving in Any War of the United States. Now in committee. These measures provide that any person who served in any war of the United States who may be suffering from the effects of any wounds, injuries, or sickness incident to service, shall be entitled to receive medical, surgical and hospital service, and supplies from the Army, Navy, or Public Health Service free of charge.

H. Res. 306. Investigation of Affairs of U. S. Veterans' Bureau. Introduced by Representative Larson of Georgia, March 17, 1922. Referred to the Committee on Rules. This resolution provides for the appointment of a select committee of seven members of the House to conduct an investigation into the conditions and operations of the U. S. Veterans' Bureau. The investigating committee is also directed to investigate whether an increase in personnel of the U. S. Public Health Service has been necessitated by its work in handling patients and disabled war veterans.

NEW LEGISLATION

H. R. 11021. Prevention of Venereal Diseases in the District of Columbia. Introduced by Representative Gilbert, March 23, 1922. This measure deals with many phases of the detection, prevention, and treatment of cases of syphilis, gonorrhea, and chancroid. Its provisions in brief follow:

(a) The chief administrative officer of every penal institution shall report all cases of venereal disease to the health officers.

(b) The judges of the juvenile court and courts of criminal jurisdiction shall report to the health officer all cases of persons brought before them for trial.

(c) The health officer and his authorized representatives shall use every available means to ascertain existence of all cases of venereal diseases.

(d) The health officer or some physician authorized to practice medicine, shall make examinations of persons believed to be afflicted. Examination, however, shall not be made without the consent of persons, except:

(e) That in cases where suspected persons refuse consent to examination the health officer shall file affidavit before any judge of police court or court having criminal jurisdiction, and the court shall thereafter order such persons to appear for examination before the health officer.

(f) Prostitutes and all persons convicted of sexual crimes are presumed to be a source of infection and subject to examination.

(g) The health officer may order infected persons into quarantine, violation of the quarantine to be unlawful.

(h) Advertising of any remedy for treatment, cure, or prevention of syphilis, gonorrhea or chancroid is made illegal, and the sale of such remedies shall be only by prescription.

(i) Physicians must report all cases within ten days, but report shall be for statistical purposes only and shall not disclose identity of persons under treatment. The physician must isolate his patient and instruct him how to prevent spread of the disease.

(j) Persons having venereal diseases shall not work as barbers, dentists, or food handlers.

(k) The penalty for violation is $100 for first offense; $300 or imprisonment for not exceeding sixty days, or both, for subsequent offenses.

The bill was favorably reported by the Committee on the District of Columbia, March 31, 1922. Only a few minor changes were made by the Committee. In its report presenting the bill to the House, these remarks appear:

"The prevalence of venereal diseases among the people of the United States is viewed with alarm, especially in medical and military circles. Hearings were had by the subcommittee that drafted this bill and many of the laws of different states were carefully considered. The committee also had the benefit of the presence of Dr. McCormack, who is chairman of the State Board of

Health of Kentucky and who has made investigations of these laws in Kentucky and other states, and especially was qualified to advise the committee by reason of the fact that he had, as an army officer, under his especial charge the cleaning up of a horrid situation during the war, in Panama, where this affliction among some classes was almost universal. The committee has not gone as far in this bill as the several states have gone and as desired by the Health Board of the District of Columbia, but it is the opinion of the committee that this bill preserves to a greater extent the individual liberties of the citizens than any other bill either presented to this Congress or enacted in the several states. It was the unanimous opinion of all doctors that these diseases more than any others require treatment, and that improper treatment is harmful, and it is provided that the advertisement and sale of medicine for their alleviation or cure is prohibited except upon the written prescription of a regular practicing physician."

S. 3337. Regulation of Cold Storage. Introduced by Mr. Norris, March 25, 1922. Referred to Committee on Agriculture and Forestry. The bill makes it unlawful for any person (1) to ship or deliver for shipment in commerce, (2) hold in cold storage while in commerce, (3) sell or offer for sale in original unbroken packages food that has been in cold storage and shipped in commerce, unless such products are plainly and conspicuously marked "Cold Storage," and in addition show the dates when put in and taken out of storage and the name and location of all warehouses in which so stored. Articles placed in cold storage and held there less than thirty days would not have to be marked. It is also made unlawful to ship, sell, or hold in storage in commerce goods which have been in cold storage for longer than twelve months. The administration of the bill would be entrusted to the Secretary of Agriculture who would also make regulations for its enforcement and provide the necessary employees.

H. R. 297—H. R. 10956. Prevention of Contamination and Pollution of Navigable Waters. Now in committee. Requests and authorizes the President to call a conference of maritime nations to consider effective means to prevent the dumping on the high seas of oil waste, fuel oil, oil sludge, oil slop, tar residue and other polluting substances.

H. R. 11040. Hospital at Cleveland, Ohio. Introduced by Mr. Norton, March 24, 1922. Referred to Committee on Public Buildings and Grounds. This bill provides for the sale of the United States Marine Hospital at Cleveland and the purchase of a site and erection of a new structure.

H. R. 11264. Medical Service for the Lighthouse Service. Introduced by Mr. Winslow, April 11, 1922. Referred to the Committee on Interstate and Foreign Commerce. This bill authorizes the Public Health Service to furnish medical, surgical and hospital care to the officers and men of the Lighthouse Service.

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LEGISLATION—STATE

(From bi-weekly reports of the United States Public Health Service with the coöperation of the National Health Council, April, 1922.)

Since all the state legislatures which have been holding sessions have adjourned except those of Massachusetts and Rhode Island, this bulletin will be the last one issued during this year.

GENERAL

THE STATES AND THE FEDERAL MATERNITY ACT

In Bulletin No. 1 (issued February 1, 1922) we reported that 25 states had accepted the provisions of the federal Act for the Promotion of the Welfare and Hygiene of Maternity and Infancy. Information from the United States Children's Bureau shows that now 36 states have signified their acceptance of the provisions of the Act. In eight of these states, the acceptance was by an act of the legislature and in the remainder, through proclamation of the governor. The states which have not yet accepted the Act are: California, Louisiana, Maine, Maryland, Massachusetts, Washington, Mississippi, Nevada, New York, Rhode Island and Tennessee. Massachusetts, whose legislature is now in session, definitely turned it down. In New York, while the federal maternity aid was rejected, both houses passed on March 17 a bill which provides $130,000 for the protection of the health of mothers, infants, and children. The State Department of Health would be charged with the administration of the Act, through a Division of Maternity, Infancy

and Child Hygiene. Kentucky, South Carolina, Virginia and New Jersey have accepted the Act during the recent sessions of their legislatures.

Kentucky

1. Child Welfare. H. 228. Creating a child welfare commission. Passed House March 2.

2. Chiropractic. H. 251. Providing for State Board of Examiners and licensing of chiropractors. Passed House, February 11.

3. Hospitals. S. 234. Appropriating $40,000 to procure land for site of Federal sanatorium. Passed House March 14.

4. Medical Practice. H. 307. Allowing a person holding a certificate to teach to enter medical college without further examination. Passed House March 11.

5. Tuberculosis. S. 72. Allowing issuance of bonds to provide tuberculosis hospitals. Passed Senate February 10; passed House March 14.

6. Vital Statistics. S. 37. Passed Senate January 25; House March 17.

H. 16. Passed House, January 31.

Maryland

1. Child Hygiene. H. 72. Creating the bureau of child hygiene in the State Health Department. Passed both houses. (A. J. P. H. April, 1922.)

2. County Health Officers. S. 51. Providing for appointment of full-time county health officers. Amended in the Senate and passed both houses.

3. Disease Control. S. 32. Relating to the control of communicable diseases by State Board of Health. Passed Senate March 7. Amended in House and passed.

4. Food and Drugs.

(a) S. 110. Relating to the licensing and inspection of bottlers of soft drinks. Amended in the Senate, and passed, and amended in the House and passed. (A. J. P. H., May, 1922.)

(b) S. 146. Relating to the enforcement of the drug laws by the State Health Department. Passed Senate, amended in the House and passed, but Senate failed to concur in the House amendments. (A. J. P. H., May, 1922.)

(c) H. 358. Permitting floating of oysters in fresh water for not more than 12 hours. Killed in House.

5. Maternity and Infancy. H. Res. 6. Accepting the provisions of the Sheppard-Towner Act. Passed both houses.

6. Midwives. S. 50. Relating to the practice of midwifery. Passed Senate and killed in the House. (A. J. P. H., May, 1922.)

7. Nurses:

(a) H. 144. Requiring the licensing of practical nurses. Passed both houses. (A. J. P. H., May, 1922.)

(b) H. 258. Crediting nurses for training received in schools of public health. Passed both houses. (A. J. P. H., May, 1922.)

8. Optometry:

(a) H. 339. Amending the Optometry Law. Passed both houses with amendments.

(b) H. 361. Amending Optometry Laws. To permit persons licensed in other states to practice in Maryland without regard to qualifications. Died in committee. (A. J. P. H., May, 1922.)

9. Osteopaths. H. 256. Extending the practice of persons licensed as osteopaths. Died in House committee. (A. J. P. H., May, 1922.)

10. Pharmacy. S. 147. To appoint an assistant food and drug commissioner. Senate adjourned with this bill on its third reading files. (A. J. P. H., May, 1922.)

11. Quarantine. H. 265. Authorizing physicians to quarantine until arrival of health officer. Passed both houses.

12. Tuberculosis. S. 33. (A. J. P. H., May, 1922.) Passed Senate, March 7.

13. Vivisection. H. 310. Prohibiting experiments on dogs. Killed in House.

Massachusetts

PROGRESS

1. Food and Drugs. The following have been given leave to withdraw, tabled or rejected:

S. 232. Candy. (A. J. P. H., May, 1922.)

S. 258. Druggists. (A. J. P. H., May, 1922.)

H. 124. Druggists.

H. 365. Liquors. (A. J. P. H., April, 1922.)

H. 559. Cold Storage.

H. 748. Marking of Foods. (A. J. P. H., April, 1922.)

2. Medical Practice. S. 292. (A. J. P. H., May, 1922.) Has been given leave to withdraw.

3. Mental Hygiene. H. 588. (A. J. P.

H., May, 1922). Has been given leave to withdraw.

4. Midwives. H. 423. (A. J. P. H., May, 1922.) Was favorably reported March 16.

5. Nurses. H. 1057. (A. J. P. H., May, 1922.) Has been given leave to withdraw.

6. School Hygiene:

(a) H. 101. Requiring examination of children returning to school after absence due to infectious disease. Signed by the Governor, March 7.

(b) H. 495. (A. J. P. H., March, 1922.) Requiring vaccination of children in private schools was favorably reported March 22, but has been defeated in the House.

7. Tuberculosis:

(a) H. 534. Requiring marking of cows which have been tuberculin tested, etc., has passed both House and Senate.

(b) H. 750. Special committee to investigate feasibility of hospital for non-pulmonary tuberculosis, was favorably reported March 21. H. 1454, a similar bill, was favorably reported on March 28.

Mississippi

1. Chiropractic. S. 358. To license chiropractors, passed the Senate. H. 413 passed the House. Several other bills were unfavorably reported.

2. Dentists. H. 336. Regulating practice of dentistry was signed by the Governor, March 25.

3. Medical Practice. H. 259. Revoking license for performing abortion or violating federal narcotic laws, passed House.

4. Mental Hygiene. H. 278 Making appropriation for the colony for feeble-minded, passed House.

5. Pharmacy. S. 53. Was approved March 30.

6. School Hygiene. A bill requiring sanitary privies at rural schools passed the Senate.

7. Venereal Diseases. H. 292. (A. J. P. H., May 1922.) Passed, but the appropriation was reduced from $20,000 to $16,000. Bills requiring pre-nuptial examinations (H. 341, H. 704), and prohibition of marriage of infected persons (H. 646, H. 647), were unfavorably reported, as was also a bill penalizing houses of prostitution (H. 819).

New Jersey

1. County Health. S. 65. (A. J. P. H., May, 1922.) Passed Senate February 21.

2. Food and Drugs. S. 14. Prohibiting adulteration of ice cream, has been signed by the Governor.

3. Tuberculosis:

(a) S. 66. Permitting counties of first class to operate and control the tuberculosis hospital and sanatorium through a committee of the Board of Freeholders. Passed Senate February 2, House March 1.

(b) S. 121. (A. J. P. H., May, 1922.) Passed Senate February 13, House February 28.

New York

The New York Legislature adjourned on March 17. Final reports as to the health bills passed have not yet been received.

PROGRESS

1. Children:

(a) Pr. S. 377. Giving justices of children's courts right to inspect institutions, has passed the Senate.

(b) S. I. 725. Requiring Boards of Education to supply food to pupils in schools of 500 or more pupils, passed the Senate.

2. Dentists. Pr. A. 781. Passed Senate and Assembly.

3. Foods and Drugs:

(a) Pr. A. 847. Repealing certain provisions in the health law about adulterated food and drinks, passed Senate and Assembly.

(b) A. I. 1060. Grading food and farm products has passed Senate and Assembly.

4. Medical Practice. Pr. S. 570. (A. J. P. H., May, 1922.) Passed Senate.

5. Municipal Health. Pr. S. 243. Regarding compensation of local health officers, passed Senate.

6. Pharmacy. S. I. 664. Regarding qualifications of pharmacists, has passed Senate.

7. Tuberculosis. Pr. A. 743. Providing for a pavilion for tuberculosis patients in the public general hospital of a county that does not have a county tuberculosis hospital. Passed Assembly. (A. J. P. H., May, 1922.)

8. Veterinary Medicine. S. I. 665. Regarding qualifications of veterinary surgeons. Passed Senate.

BILLS NOT PREVIOUSLY REPORTED

1. Coroners. Pr. S. 1536 and Pr. A. 1839. Requires coroner to be physician with at least three years' experience in actual practice.

2. Garbage. Pr. S. 1465; Pr. A. 1805. Makes regulations concerning transportation of garbage by barge to sea.

3. Mental Hygiene. Pr. S. 1716; Pr. A. 1907. Provides for commitment of insane veterans on request of U. S. Veterans' Bureau.

4. Midwives. Pr. S. 1340; Pr. A. 1996. Regarding the licensing and registration of midwives.

5. Tuberculosis:

(a) Pr. S. 1606. Requires thorough examination of all dairy cows in the state by means of the tuberculin test.

(b) Pr. S. 1731. Provides for disposition of tubercular carcasses and prohibits sale of such carcasses for human consumption unless disease is localized and carcass has been sterilized.

6. Water and Sewage:

(a) Pr. S. 1566; Pr. A. 1938. Gives State Commissioner of Health complete jurisdiction of water purification or treatment plants.

(b) Pr. S. 1565; Pr. A. 1939. Outlines qualifications of superintendents or operators in charge of plants for water purification.

The following bills have been signed by the Governor and are now laws:

Pr. S. 692, amending the Farms and Markets Law generally, is Chapter 48; while the companion bill S. 796, amending the Penal Law re adulterated food is Chapter 122.

Pr. S. 1113, amending general municipal law, providing for occupational therapy departments in connection with public general hospitals is Chapter 161.

The three bills amending the public-health law re dentistry, veterinary medicine, and pharmacy are Chapters 178-179 and 183 respectively.

Pr. A. 1530, amending the public-health law re county mosquito extermination is Chapter 196.

Pr. A. 307, providing that city health commissioner appointed under Chapter 249 laws of 1921, shall not be removed except after public hearing is Chapter 197.

Pr. S. 1105, to amend the public-health law re practice of optometry. (Chapter 245.)

Pr. S. 1366, to amend the farms and market law re diseases of domestic animals. (Chapter 255.)

Pr. S. 1114, to amend the general municipal law re public general hospitals for care of the sick. (Chapter 265.)

Pr. A. 1756, amending the public-health law re practice of nursing. (Chapter 288.)

Pr. A. 1310, amending public-health law by repealing article 4 re adulteration of food and drugs.

Pr. S. 1179, Pr. S. 1369, Pr. S. 1181, amending farms and markets law re milk, skimmed milk and by-products.

Pr. A. 1454, amending farms and markets law re grading of food and farm products.

Pr. A. 1429, amending farms and markets law re imitation butter, etc.

Pr. S. 1552, amending farms and markets law re heating skimmed milk, etc., before used for feeding.

Pr. S. 1831, amending public-health law re division of maternity, infancy, and child hygiene.

Pr. S. 1583, amending conservation law re water supplies.

Pr. S. 1671, amending public-health law re vital statistics.

Pr. S. 1734, amending the education law re compulsory education and physical examinations.

Pr. S. 1340, amending public-health law re licensing of midwives. (Chapter 501).

Rhode Island

1. Maternity. A second bill, H. 719, has been introduced to accept the terms of the Federal Maternity and Infancy Act.

2. Venereal Diseases. H. 852. Would appropriate $25,000 for the prevention and treatment of venereal diseases.

Virginia

The U. S. Children's Bureau reports that the following bills proposed by the Children's Code Commission of Virginia were passed by the General Assembly.

a. The bill providing for changing the name of the State Board of Charities and Corrections to State Board of Public Welfare, making that Board the State Board of Children's Guardians, creating within that board a children's bureau, and providing for the establishment of local boards of public welfare in each county of the state, was passed in substantially the form in which it was presented.

b. Juvenile Court Bills. The juvenile court procedure bill provides for chancery proceedings, instead of the old semi-criminal procedure, which has previously existed. A new bill extends the juvenile and domestic relation courts system to the counties of the state, giving these courts practically the

same jurisdiction now exercised by such courts in cities.

c. A group of bills providing for (a) public relief for children in their own homes to be administered by the local board of public welfare; (b) regulating child-placing and child-caring institutions and agencies; (c) regulating maternity hospitals; (d) regulating boarding houses and nurseries for children under six years of age. No state appropriation was made for the operation of the mother's aid law.

d. A new child labor bill, which is a decided improvement over the existing law, was adopted. It still retains, however, the exception permitting children between the ages of twelve and sixteen to work in fruit and vegetable canning factories during the summer vacation.

e. A new compulsory school attendance law requiring children between the ages of eight and fourteen to attend school.

A number of other minor measures were passed, making a total of eighteen out of twenty-eight bills.

1. Tuberculosis. H. 354. (A. J. P. H., May, 1922) has been signed by the Governor.

2. Venereal Disease. S. 335 (A. J. P. H., May, 1922) has been signed by the Governor.

3. Vital Statistics. H. 5 (A. J. P. H., May, 1922) has been signed by the Governor.

Canada

The following bills having been received from Canada, we are including brief abstracts of them to show tendencies in health legislation there:—

Alberta

1. Hospitals.

(a) No. 71. Amends the Municipal Hospitals Act. (No.2)

(b) No. 72. Amends the Hospitals Ordinance.

2. Medical Practice. No. 91. Amends the Medical Profession Act.

3. Public Health. No. 85. Amends the Public Health Act.

4. Venereal Diseases. No. 36. Amends the Venereal Diseases Prevention Act.

Manitoba

1. Child Welfare. No. 7. Creates a Department of Public Welfare with a Director of Child Welfare under it. The bill deals with juvenile courts, neglected children, illegitimacy, feeble-mindedness, handicapped and immigrant children, child welfare, organizations, etc.

2. Hospitals. No. 29. Amends Hospitals Aid Act.

Nova Scotia

1. Hospitals. No. 53. Amends law. Requires approval of plans by Governor in Council before construction; requires admission of tuberculous patients to hospitals.

2. Public Health. No. 68. Amends law in a number of particulars.

Ontario

1. Nurses. No. 152. Requires registration of nurses.

Quebec

1. Bureau of Health. No. 203. Would establish a provincial bureau of health, defining organization and duties.

2. Vital Statistics. No. 11. Amends law regarding statistics of deaths of foreigners.

STATE HEALTH NOTES

California

The city of Long Beach has fully established a public welfare department, in which provision is made for carrying on all school, county and private constructive and relief measures under one superintendent. This plan has operated so successfully during the six years prior to its official adoption by the city that the public was quite ready to take it over in its entirety. While the health department has to do with unwholesome conditions and disease, endangering the public at large, the welfare department has to do with social ignorance and error in their incipiency, with the intricacies and the secrecies of poverty, disease and crime. A very interesting article on this subject by Dr. G. Hardy Clark of Long Beach appeared in the JOURNAL in May, 1921.

✣

In order to distribute quickly and more extensively current information concerning the prevalence of communicable diseases, and in order to give public-health workers closer coöperation in the control of outbreaks of these diseases, the California State Board of Health is publishing the *Weekly Bulletin*, which takes the place of the

mimeographed *Public Health News*. The first number was issued February 18. The *Monthly Bulletin* is discontinued and in its place there will be issued a *Quarterly Bulletin* which will contain full statistical data and complete summaries and reports of the Board's activities.

Cuba

On January 30 there was formed in the city of Havana the "Sociedad Cubana de Gastro Enterologia," and on February 13 the following officers were elected: President, Dr. F. Grande Rossi; Vice-President, Dr. F. Torralbas; Secretary, Dr. F. Solano Ramos; Vice Secretary, Dr. Pedro Barillas. The object of the society is the promotion of scientfic study of the digestive organs and the wider diffusion of such knowledge among the profession and the public.

District of Columbia

Dr. Lewis A. Newfield, assistant health officer, District of Columbia, resigned on March 5, 1922, to resume private practice in Brooklyn, New York.

Col. James G. Cumming was appointed, March 6, 1922, as assistant health officer, coming directly from the Medical Reserve Corps, U. S. A., where he has been coöperating in the preparation of the Medical History of the war.

✚

A leaflet has been issued by the District Health Department warning automobile owners and mechanics against poisoning from the fumes of gasoline engine exhausts, and of the necessity of adequate ventilation in garages.

Florida

The State Board of Health recently consolidated the Bureau of Venereal Disease with several activities, heretofore carried on by other bureaus, in the Bureau of Communicable Disease, with Dr. George A. Dame as Director. Dr. Dame had previously served as director of the Bureau of Venereal Diseases. The divisions of the new bureau are: Field Service, consisting of the district health officers, Venereal Disease Control, County Health Work, and Epidemiology.

✚

The State Board of Health and the International Health Board coöperating have recently completed a hookworm survey of eight counties. The data collected will be turned over to the Bureau of Child Welfare of the State Board of Health for an active campaign of education and treatment.

✚

Dr. F. A. Brink, district health officer in West Florida, has been carrying out an active campaign against typhoid fever in Escambia County. Nearly five thousand inoculations have been made within the past three weeks.

✚

The Bureau of Communicable Disease is making through its division of field service brief surveys of each county covering about one hundred and fifty physical, sociological and sanitary questions that frequently arise in the administration of public-health activities in the state.

Captain W. H. Gillette, of the U. S. P. H. S., who has been detailed to the Bureau of Communicable Disease, Division of Venereal Disease Control, is carrying out an extensive program of lectures and motion pictures throughout the state on social hygiene.

✚

Under the auspices of the Florida Public Health Association an itinerant chest clinic was held recently in Ft. Pierce. The director of nursing service for the Association preceded the clinic by several days, visiting those who expected to attend the clinic. Dr. Louis Limbaugh, of Jacksonville, and Dr. T. A. Blinn, of the State Board of Health, were the examiners. This clinic was one of those supported by the sale of Christmas seals last December and the membership dues of the Florida Public Health Association. The State Board of Health is coöperating by furnishing an examiner.

✚

Jacksonville is preparing for its spring barrage on mosquitoes. All winter the authorities have been active in draining lowlands, cleaning gutters and ordering the removal of any debris that might become breeding places for mosquitoes. Dr. MacDonell, city health officer, points to the low malarial rate in Jacksonville last summer. He says: "Malaria is caused only by the bite of the mosquito. The popular idea that malaria was caused by stagnant water was

no doubt brought about by the fact that wherever there was stagnant water malaria was prevalent. This was due to the fact that mosquitoes breed in stagnant water. Incidentally, now is the time to start swatting the fly."

Georgia

Dr. H. E. Felton has been appointed commissioner of health of the Bartow County Board of Health, Cartersville, Georgia, succeeding Dr. W. H. Ennis, who has received an appointment in New Mexico. The Bartow County Board is thoroughly organized and receives the active support of the people of the county. It has a county committee of eight leading women to act as an auxiliary board of health, with district committees in every village and town in the county. These committees will arrange for the holding of clinics, at strategic places, follow up the physical examinations of school children for the correction of defects, perform the functions of sanitary police and inspection officers, and see that quarantine regulations are enforced. The new commissioner has adopted an enterprising policy and has sent out a printed letter to all citizens of the county.

✣

Valdosta is doing all it can to reach the public through "Out of the Shadows," the Bureau of Animal Industry film. Picture managers have given the use of their theatres and a number of citizens have given considerable effort to securing this film, and trying to reach as many people as possible. The film shows how animal tuberculosis can be communicated to people through the milk of a tuberculous cow, the clean-up of a farm, and the cure of the infected person. The Kiwanis Club is also coöperating with the city and state officials in public-health work along the lines of an active campaign against tuberculosis among animals.

The Directors of the Chamber of Commerce of Valdosta have unanimously adopted a resolution endorsing the efforts and methods of the Sanitary Department in the eradication of flies.

Illinois

Flood conditions have given rise to more or less serious sanitary and public-health problems at various points along the larger streams in Illinois where hundreds of families have been made homeless.

Sanitary engineers and district health superintendents from the State Department of Public Health have been constantly on duty in the flooded areas since conditions first became serious. The sanitary problems in connection with temporary housing conditions and the disruption of sewerage systems by the flood waters have been many.

The State Department of Public Health has sent out general public warnings in connection with the probable appearance of local typhoid fever and other waterborne epidemics if proper and rigid sanitary precautions are not taken. The public in the flooded districts have been advised to boil all drinking water consumed during the high water period and until the lapse of several weeks after the water subsides. General anti-typhoid vaccination has also been recommended.

The department of health furnish triple typhoid vaccine free of cost.

✣

The State Department of Public Health, with the approval of the Illinois Board of Public Health Advisors, has adopted a railway sanitary code. The code as adopted conforms to the railway sanitary code recommended and approved by the Conference of State and Provincial Health Authorities and has the approval also of the United States Public Health Service and the American Railway Association. Similar codes have already been adopted in about twenty states and it has been the aim of the state, federal and railway health officials to have the Railway Sanitary Code uniform in all states because of the inter-state connection of railroads.

The Railway Sanitary Code regulates the transportation of persons having communicable diseases, the water and ice supplies for railway trains, stations, offices and shops, the cleaning and disinfection of cars, the sanitary condition and control of cars while in service and the sanitary conditions at railway stations, railroad construction camps, offices and shops.

✣

A new clinic for crippled children has been established by the Division of Child Hygiene and Public Health Nursing of the State Department of Public Health at Rochelle. Dr. L. A. Beard, president of the board of directors of the Ogle county tuberculosis

sanatorium was largely responsible for the establishment of the clinic, and he has been placed in charge of local details. The clinic will function as an integral part of the work of the DeKalb County Health League, an organization which effectively coördinates the efforts and expeditures of all health agencies, whether governmental or extra-governmental in DeKalb, Lee, Whiteside, and Ogle counties. The opening of the crippled children's clinic is only one of the new and worth-while functions made possible by the unification of public-health activities in the district.

✚

The State Department of Public Health is carrying out the most complete series of public-health demonstrations ever attempted in southern Illinois. Carbondale, Harrisburg, Benton, Marion and Centralia are the places visited. The program embraces trachoma, tuberculosis and orthopedic demonstration clinics as well as demonstrations in medical inspection of school children and in the carrying out of better baby conferences. Besides these things there is on display the public-health exhibit equipment from the State Department of Public Health, and a number of motion picture films and lantern slides are shown. Lectures are being delivered by the physicians and others in charge of the program. The schedule calls for three days in each of the places named above, the first on the list being Carbondale on April 20, 21 and 22, the others following on the last three days of each succeeding week, in the order listed above.

✚

A new motion picture film entitled "One Scar or Many" has been added to the loan service of the State Department of Public Health. The picture shows pertinent facts concerning smallpox and vaccination in a pleasing and instructive fashion and is suitable for popular use. This and fifteen other films may be had by physicians and others interested in popular health education without cost other than one-way transportation charges. Requests for this service should be addressed to the Director of Public Health, Springfield, Illinois.

✚

The State Department of Public Health has completed arrangements for establishing a new branch diagnostic laboratory at East St. Louis. The diagnostic work, which will include only the examination of diphtheria cultures, will be carried out in the city public-health laboratory under the direction of the local health commissioner, Dr. C. W. Lillie. The East St. Louis branch will also be utilized as a distributing station by the State Department of Public Health, such things as specimen mailing containers, swabs, antitoxin, triple typhoid vaccine, etc., being available to physicians in southern Illinois from that point. This brings the total number of branch laboratories in the state up to seven, the others being located at Ottawa, Urbana, Mt. Vernon, Galesburg, Moline and Chicago.

✚

The Surgeon General of the U. S. Public Health Service has recommended that Thos. G. Hull, Ph.D., superintendent of the diagnostic laboratories of the State Department of Public Health, be appointed as assistant collaborating epidemiologist for the U. S. Public Health Service in Illinois.

✚

Dr. Clarence D. McKinney of Paxton, Illinois, has recently been appointed a district health superintendent under the direction of the State Department of Public Health. His territory will include Ford and McLean counties. Dr. McKinney's appointment brings the total number of such officers who are now active in the state service up to twenty.

Indiana

The Indiana State Health Exposition at Indianapolis, May 19-27, is being held under the auspices of the State Board of Health and the Indianapolis City Board of Health in coöperation with a number of national organizations. There are motion pictures, lectures, lessons, models and special features. The Manufacturers Building at the State Fair Grounds is the scene of this great undertaking. This gigantic display is expected to pave the way for a public awakening to the loss of lives from preventable diseases and to the importance of raising the standard of public health.

One of the opening features of the Exposition was the unveiling of a colossal plaster statue of the Goddess Hygeia. The first speech was made by radiophone by President Harding, the next by the presi-

dent of the day, Governor Warren T. McCray, who upon signal, which was the Governor's salute, fired by artillery, drew the string unveiling the statue. One hundred nurses were present to do homage to the goddess.

✚

Upon favorable report from Hillsboro, Ill., of the success of the Eagle-Picher Co. in putting milk on tap for its employees, the Tuberculosis Society of Huntingdon, Ind., started the same movement in local factories. The Purdue University workers were invited to push the work in the high schools, and in the factories among the adults in general. Employers and managers approved the plan; a committee then visited the different factories during the noon hour, giving short talks to employees; dairymen were urged to interview managers; with the result that three of the largest factories were soon serving milk, two of them at noon, and the other at 9, noon, and at 3, the employees buying when they chose. The Erie R. R. Shops are serving milk at noon. At the Huntingdon Shoe and Leather Factory, 1,200 pints are consumed weekly, and the superintendent is convinced of its efficiency, claiming that the men work better when served at 9, having had early breakfasts. The milk is carried through the shops and sold wherever desired.

Kansas

Miss Hulda Cron, state supervisor of public-health nursing, has been appointed as full-time health officer for Ottawa County beginning June 1.

Dr. F. G. Pedley, epidemiologist, is making an educational campaign throughout the state showing moving-picture films on smallpox vaccination, the production and use of diphtheria antitoxin, Schick tests, and toxin-antitoxin.

A school for health officers was held in Kansas City, Kansas, April 10 to 15.

Kentucky

The Bureau of Child Hygiene of the State Board of Health of Kentucky has been designated by Governor Morrow as the department to administer the joint federal and state funds as provided under the Sheppard-Towner Maternity and Infancy Act recently enacted by Congress. The recent session of the General Assembly made the necessary appropriation to meet the funds allotted to Kentucky for this work by the Children's Bureau. Dr. Annie Veech of Louisville, who is the Director of the Bureau of Child Hygiene of the State Board of Health, will have entire charge of the Maternity and Infant Hygiene work in the state.

✚

Dr. Frank J. O'Brien of the National Committee of Mental Hygiene, and his associates are conducting an intensive mental survey of school children in the city of Louisville in collaboration with the Louisville Mental Hygiene Society and Conference of Social Workers.

✚

A very interesting feature in connection with the progress of the School of Public Health of the University of Louisville and the State Board of Health is the course which has just been inaugurated for the training of sanitary inspectors. Five young men, assigned by the Federal Board of Vocational Education, are taking this course, and the prospects for the future of this departure are very bright. The course consists of eight months of theoretical work in the school, with certain periods of assignment for field work, under the direction of the State Sanitary Engineer, and the Director of the Bureau of Foods, Drugs, Hotels and Restaurants. In addition to this, there is included in the course four months of intensive field work in the counties maintaining all-time health departments.

The School of Public Health will graduate two health officers and nine public-health nurses on June 8. The graduation exercises will be conducted jointly with the other departments of the University of Louisville. Dr. J. N. McCormack is dean of the School of Public Health.

✚

Dr. A. T. McCormack, state health officer of Kentucky, is making an extended tour of the West during the month of April, representing the U. S. Public Health Service on a program of public-health institutes.

Miss Sarah H. Vance, director of Bureau of Foods, Drugs and Hotels, who is Secretary of the Association of Food, Feed and Drug Officials of the South Central States, attended a meeting of that association at Galveston, Texas, May 8, 9 and 10, and

read a paper on the "Need for Training of Sanitary Inspectors," at this meeting.

Dr. W. N. Lipscomb, full-time health officer of Scott County, resigned the 1st of March to take a position as Instructor in Public Health and Hygiene in the University of Kentucky. Dr. H. V. Johnson, Georgetown, Ky., is acting health officer of Scott County until such time as Dr. Lipscomb's successor may be secured.

Dr. C. B. Kobert, director of the Bureau of Trachoma of the Kentucky State Board of Health, together with his assistants, is making an intensive survey of counties in western Kentucky to determine the prevalence of trachoma in that portion of the state.

Massachusetts

Mayor Curley of Boston has appointed Dr. Francis X. Mahoney as health commissioner to succeed Dr. William C. Woodward, who has held the position since August, 1918, and who resigned February 4. Dr. Mahoney held this position prior to Dr. Woodward's appointment. He was appointed to the Board of Health in 1910, serving continuously for eight years as member of the board and later as chairman of the board. In 1916 a change in the city ordinances provided for the control of the department by one official at which time he became Health Commissioner.

✣

Under the direction of the State Department of Public Health and the Department of Education, regional conferences on school hygiene are being conducted. In these conferences school superintendents, medical inspectors and school nurses meet to confer with representatives of the two state departments on matters concerning school hygiene. A play demonstrating the value of school nursing has been presented as one feature of the conferences.

✣

Dr. Oscar A. Dudley has been transferred, as district health officer of the State Department of Public Health, from the Berkshire District to the Worcester County District.

Dr. Leland M. French, now holding the position of epidemiologist of the State Department of Public Health, will succeed Dr. Dudley in the Berkshire District on May 1, 1922.

Dr. Francis A. Finnegan, formerly district health officer of the Worcester County District, has accepted an appointment as director of school hygiene under the Board of Health of Lowell, Mass.

Michigan

An outbreak of hemorrhagic smallpox was started in February by an orderly at Hackley Hospital, Muskegon, who refused vaccination, after exposure through transferring a smallpox patient to another ward. He died, and there were 28 other cases, 8 of which were fatal.

In 1916 smallpox broke out in Mason, county-seat of Ingham County, and general vaccination of all school children was ordered. The parents of one girl, acting on their prerogative refused to allow vaccination and the child was excluded from school until the epidemic subsided. She did not contract the disease.

On Feb. 25 Carol Ellsworth, the former Mason girl who was never vaccinated, dietitian of the Hackley Hospital at Muskegon, contracted "black" or hemorrhagic smallpox. She died from the disease on March 7.

Receiving word that Carol was sick the mother had gone to Muskegon to see her daughter. There she learned that the hospital authorities would not let her see her child unless she was vaccinated. Though she professed not to believe in vaccination, she consented in order to gain admittance to the sick room. After the death of the girl the mother was disinfected and permitted to return home. She developed a slight rash which her family physician declared was not smallpox.

But on April 2, her husband, Homer Ellsworth, who had never been vaccinated, became sick with confluent smallpox, a slightly milder form than the hemorrhagic smallpox. He died from this preventable disease on April 12.

"This series of events," says Dr. R. M. Olin, commissioner of health, "should serve as a timely warning to all parents that it is their duty to have their children vaccinated, advisably before two years of age and again at 15 or 16. Personal liberty grants any one the right to contract smallpox—and die with it—if he does not believe in vaccination, but

it does not give him the moral right to leave helpless children unprotected."

✚

"Detroit's Government," a 77-page pamphlet published by the city authorities, gives a concise statement for the benefit of the citizens, of services rendered by the various city departments during 1921. The Health Department occupies 9 pages with a variety of interesting figures telling of positive and creditable health chievements.

The death-rate of 11.0 was the lowest in the history of Detroit, the previous low mark being 12.3 in 1919. The vital statistics are calculated on the basis of the school census of 1921 which gave the city 942,373 inhaibtants, rather than the federal census of 1920 (993,739) or the 1921 federal estimate (1,070,000). Had the latter been used, the death-rate would have been but 9.7, but all local evidence goes to show that the present industrial depression has caused a distinct reduction in the urban population of Detroit.

The present year also marks the city's lowest infant mortality rate, 83.6. Tuberculosis and pneumonia reached new lows, with 94 and 95 respectively, the later being a reduction of more than 60 per cent over the 1920 rate of 237 per 100,000.

A Municipal Tuberculosis Sanitorium of 300 beds has been completed, releasing the children's beds at the Herman Kiefer Hospital for adult contagious and maternity cases. A notable system of summer health camps, nutritional correction work, and other advances in child hygiene is in effect.

✚

A joint committee has been formed representing the University of Michigan, Michigan State Medical Society, the State Department of Health, the Detroit College of Medicine and Surgery, and the Michigan State Dental Society, to present to the public fundamental facts of modern scientific medicine, thus building up sound opinion concerning questions of public and private health. Any community wishing to secure a lecturer may apply to the Committee. All expenses of lecturers will be paid by the organizations which they represent.

✚

Dr. Blanche M. Haines has accepted the position of director of child hygiene and public-health nursing of the State Department of Health to succeed Miss Harriet Leck, R. N., director, whose resignation became effective May 15. An assistant to Dr. Haines, who will be a registered nurse, will have supervising charge of the public-health nursing program.

Both Dr. Haines and her husband, Dr. Thomas J. Haines, have been in private practice for a number of years in Three Rivers, Michigan. Before her recent work of directing the medical work of the Maccabee order, Dr. Haines acted as chairman of the division of public health of the Michigan Federation of Women's clubs. She is a graduate of Northwestern University Women's college, served her internship in the Mary Thompson Hospital, took postgraduate work at the Philadelphia Polyclinic, and later had charge of a Chicago dispensary.

Since organization of the Bureau of Child Hygiene and Public-Health Nursing in September, 1920, Miss Leck has been instrumental in installing public-health nursing programs in 14 counties, well-baby conferences in 28 towns, and in effecting a coöperating program with the Red Cross, the Michigan Tuberculosis association and the State Department of Health.

Minnesota

A Public Health Institute was held in Minneapolis March 20 to 25 at the University of Minnesota by the State Board of Health and the U. S. Public Health Service. There were lectures, clinics, demonstrations and conferences. Course I covered the following subjects: Venereal Diseases, Syphilis, Gonorrhea, Public-Health Education and Venereal Disease Control. A lecture on the development of modern scientific medicine was given, including a moving picture entitled "The Invisible World." Course II consisted of twenty lectures on Maternal and Infant Hygiene.

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During 1921 the State of Minnesota through its legislative authority accepted the federal provisions for the public protection of maternity and infancy, empowering the State Board of Health to coöperate with the federal Children's Bureau to carry out the purposes of such act, and appointed the state treasurer as custodian of all moneys given

to the state by the United States under the authority of such act for the purposes therein specified. On January 10, 1922, the State Board of Health took preliminary steps toward organization, and at the Public Health Institute held March 20 to 25 arrangements were made, upon checking membership through the counties and finding that there would be no woman or but one on the Board in some counties, that the administrative boards may be increased from five to seven members if necessary, so that no administrative board will have less than two women as members.

Montana

In habeas corpus proceedings brought before him, the chief justice of the Supreme Court of Montana has decided that a person who was detained by order of a health officer because reasonably suspected of being venereally infected, was not entitled to a judicial hearing prior to the time of taking and detention.

The complainant was held by the sheriff of Missoula County under an order of the health officer of the city and county of Missoula, on the ground that, according to the information of the health officer, she was affected with gonorrhea, a disease declared by the statute to be contagious, communicable, and therefore dangerous to the public health.

That the complainant was affected with such disease was ascertained by scientific means by the bacteriologist employed by the State Board of Health upon application of the health officer. She had within a comparatively short time prior to her arrest been plying her trade of prostitution and was found among other prostitutes and in places where women not engaged in prostitution would not be found. Upon this evidence the chief justice was constrained to the conclusion that the health officer was justified in directing her detention until she had become cured or it is safe to allow her to go at large. Therefore the writ was discharged and the complainant remanded to the custody of the sheriff to be held until she should be released according to law.

New Mexico

On December 31, 1921, P. A Surgeon C. E. Waller, of the Public Health Service, completed his detail as temporary health officer for the state, and returned to Washington for duty at the Hygienic Laboratory. Dr. Waller served continuously from July, 1919, in this capacity, and organized the State Bureau of Public Health. He was succeeded by Dr. G. S. Luckett, who had been with him as chief of the Division of Preventable Diseases from the inception of the department.

✚

Dr. R. M. Schwartz, formerly health officer of Salem, Ohio, was appointed full-time health officer of Santa Fe City and County, and took office on the first of February, succeeding Dr. D. B. Wilson, who was detailed by the International Health Board to Honduras.

Dr. O. C. West was appointed full-time health officer of Albuquerque and the county of Bernalillo, on the 15th of December, 1921, succeeding Dr. J. F. Docherty, who was sent by the International Health Board to Ceylon. Dr. West has had many years' experience in industrial hygiene in Mexico and Central America, and has just returned from two years in China.

Dr. D. B. Williams, formerly of Portales, New Mexico, took the position of full-time health officer of Torrance County on January 1. Dr. Williams has his headquarters at Estancia.

Dr. K. A. Bryant, for two years health officer in Marysville, Tennessee, was appointed full-time health officer of Roswell and Chaves County on February 1, succeeding Dr. D. W. Gudakunst who was serving under the International Health Board.

Dr. Edgar B. Beaver, formerly of Wyoming, was appointed full-time health officer of Valencia County, and took office February 1. Dr. Beaver has his headquarters at Los Lunas.

Three new public-health nurses have been assigned to county health departments, this year. They are Miss Maude Howson, Torrance County, Miss Irene Macdonald, Union County and Miss Gladys Harris, Valencia County.

Dr. W. H. Ennis, formerly health officer of Cartersville, Georgia, took charge of the full-time county health department of Eddy County, with headquarters at Carlsbad on April 1.

H. F. Gray, chief of the Division of Sanitary Engineering and Sanitation, of the State

Bureau of Health, has completed two tours of inspection, covering the entire southern portion of the state. These inspections are made partly in collaboration with the U. S. Public Health Service, and are concerned with the quality of drinking water furnished to interstate carriers. A number of towns are contemplating bond issues for water supplies and sewage disposal works, and have had the personal assistance of Mr. Gray in making their plans.

Miss Margaret Tupper, chief of the Division of Child Hygiene and Public Health Nursing has made several trips for the purpose of instructing new nurses in their duties, and inspecting the work of those who are continuing from last year.

The State Department of Public Welfare has authorized the creation of a Division of County Health Work, under a chief who should correspond to the director of rural sanitation found in many state organizations. This work, as well as that of the full-time counties, will be done in coöperation with the International Health Board. So far, the position has not been filled.

On April 27 a joint meeting of the New Mexico Health Officers' Association and the Public Health Nurses' Association was held at Albuquerque. A very full program occupied the entire day, with the end of making the meeting as practical as possible for both the full-time and part-men, and for the nurses. One of the leading features of the meeting was a round-table discussion of the problems which each health officer encounters in his work. A banquet was held in the evening at the Alvarado Hotel. On the same date a meeting of the Graduate Nurses' Association of New Mexico was held in Albuquerque.

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On April 28 and 29, the New Mexico State Medical Society met in Gallup. At this meeting, the Bureau of Health exhibited the wax models of syphilitic lesions recently made by the American Social Hygiene Association and in connection with this, presented the Association's film on the treatment of syphilis. Dr. Luckett presented a paper to the Society on "The Relationship of the Medical Profession to the Health Department."

The free venereal disease clinics in Santa Fe and Albuquerque are increasing their attendance rapidly, in spite of the fact that the work must be done entirely through the volunteer services of local physicians.

✣

There are now eight counties organized on a full-time basis, with a health officer and a public-health nurse in each. In some cases, there are two nurses working under the direction of the health officer, and also a sanitary inspector. This is an increase of three full-time counties over 1921. The five counties adopting this program last year are continuing through 1922.

The Bureau of Public Health has inaugurated a weekly bulletin for its health officers, in which are given the number of diseases reported for the preceding week, by counties, and also short paragraphs of news or instructions of particular interest to the health officers.

New York

The sixth annual meeting of the New York State Association of Public Health Laboratories was held in Albany on April 19. The scientific program included the following papers: A Comparison of Room, Icebox and Ice Water Bath Temperatures for the Fixation of Complement, by Misses Hannah V. Langworthy and E. Jane Kerley, Albany; Production of Anti-sheep Amboceptor in a Mule, by Miss Ruth Gilbert, Albany; A Summary of the Results of Recent Investigation on Pertussis Vaccine Carried Out at the Bureau of Laboratories, Department of Health, New York City, by Dr. Charles Krumwiede, New York City, Leptospiras, Pathogenic and Nonpathogenic, by Dr. Hideyo Noguchi, New York City—discussion opened by Dr. Augustus B. Wadsworth, Albany; Changes in Virulence of Tubercle Bacilli, by Dr. Edward R. Baldwin, Saranac Lake—discussion opened by Dr. Paul A. Lewis, Philadelphia, Pa.

At the business session the officers elected were: President, Dr. W. B. Stone, Schenectady; Vice-President, Dr. W. C. Noble, New York City; Secretary-Treasurer, Miss M. B. Kirkbride, Albany; Member of Council, Dr. Ellis Kellert, Albany.

The midyear meeting of the association will be held in the autumn at the State laboratory, Albany.

Accidental infection of a young woman bacteriologist from a rat which she was examining in search of the germ of epidemic jaundice has furnished the first direct evidence that microbes harbored by these rodents can induce that disease in human beings, according to a report recently submitted to Dr. Hermann M. Biggs State Commissioner of Health, by Dr. Augustus B. Wadsworth, Director of the Division of Laboratories and Research.

"On Friday, February the 3rd," said Dr. Wadsworth's report, "one of our laboratory workers who was preparing for the inoculation of a rabbit with a virulent culture of the leptospira from a rat pricked her finger with the needle of the syringe containing the culture. The wound was cleaned and disinfected and there were no symptoms until the evening of February 10th when a fever commenced accompanied by general malaise, nausea and vomiting. Although the patient's temperature reached 104 degrees there was no sign of involvement of any of the organs. In fact, the diagnosis was quite obscure until cultures of the leptospira were finally obtained. Forty-eight hours after the onset a specimen of blood was taken for culture and for the inoculation of guinea pigs. The direct examination of the blood specimen showed a few forms resembling leptospira which, however, could not be definitely identified. Further specimens were taken on the fourth day but no definite evidence of the presence of the organism was obtained until February 24th when one of the guinea pigs inoculated on February 12th developed jaundice. The following day a second guinea pig, inoculated on February 14th, also developed jaundice. It was at once chloroformed and examined and the characteristic forms of the leptospira were found. The result of the examination therefore leaves no question as to the diagnosis of jaundice."

Dr. Noguchi of the Rockefeller Institute was the first scientist to find the jaundice organism in rats in this country some years ago. This organism resembles very closely the germ recently discovered by Dr. Noguchi and supposed to be the cause of yellow fever. As soon as he learned of the discovery at the State Laboratory, Dr. Noguchi went to Albany to check over the technical details of the work and to lend the benefit of his long study and experience with this group of microörganisms. He took back to New York with him specimens of blood from the patient which proved to be negative on direct examination but when some of the blood was later injected into guinea pigs at the Rockefeller Institute these animals also developed jaundice, thus confirming the findings previously reached.

"In this accidental infection of the human being with the germ being studied," said Dr. Biggs, commenting on Dr. Wadsworth's report, "we have a clear fulfillment of the requirements laid down by the eminent scientist, Robert Koch, as necessary to show the causal relationship of a micro-organism to disease in man.

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A testimonial dinner to Dr. S. Josephine Baker, on the occasion of her completion of twenty years of service in the New York City Department of Health, thirteen of which were spent as director of the Bureau of Child Hygiene, the first in any American city or state, which she founded, was given at the Hotel Commodore, New York City, April 25.

About 350 of Dr. Baker's loyal friends in all circles of the city's life gathered to pay her tribute. Dr. Henry Dwight Chapin was toastmaster. Miss Grace Abbott spoke for the Federal Government, Dr. Henry L. K. Shaw for the State Department of Public Health, Commissioner Royal S. Copeland for the City Department of Health, Dr. L. Emmett Holt for the pediatrists, Miss Annie W. Goodrich for the public-health nurses, Bailey B. Burritt for the social workers, Miss Mary Arnold for the co-operating private agencies, Dr. Alice M. Wakefield for the women physicians, and Mrs. A. Gordon Norrie for the women of the state. Dr. Baker responded gracefully and in prophetic vein.

North Dakota

Dr. Robert Oleson, Surgeon, U. S. Public Health Service, recently on duty in Wisconsin, has been assigned to North Dakota to assist in public-health work.

Oklahoma

A Bureau of Maternity and Infant Hygiene is soon to be established, under the Sheppard-Towner Act, for the state of Oklahoma, and Miss Leila Hoagland has been named director.

Recent appointments of health officers have been made as follows: for Grant

County, Dr. J. E. Hall, and for Wagoner County, Dr. M. R. Joblin of Parker.

Elsewhere in this issue is announced the distressing death of Jules Schevitz, secretary of the Oklahoma Public Health Association. Miss Mary Hastings, former assistant secretary is now acting secretary.

Oregon

The Oregon State Board of Health and the United States Public Health Service held a Public Health Institute and Conference of City and County Health Officers, April 10 to 15 at the Multnomah Hotel, Portland. The faculty was composed mostly of local physicians. Clinics were held at the People's Institute, visits were made to the University of Oregon Medical School and various hospitals.

South Dakota

Dr. Clara Edna Hayes of Illinois, graduate of the Illinois College of Physicians and Surgeons, and for the past four years superintendent of the State Training School for Girls at Geneva, Illinois, has been appointed head of the newly created Division of Child Hygiene. This Division is created for the purpose of carrying out the provisions of the Sheppard-Towner Law.

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A. H. Wieters, head of the Department of Sanitary Engineering, late of the State Department of Engineering of Kansas, finds a field ripe for a larger effort in organized sanitation. Calls are coming from all parts of the state for the assistance of this Department in local drainage and sanitation problems.

Saskatchewan

Commissioner Seymour is endeavoring to impress upon the municipal authorities of the province the necessity of a properly pasteurized milk supply. Most of the cities and towns of Saskatchewan have enacted a by-law making pasteurization compulsory, but so far the city of Regina has lagged behind the procession, having refused to enact such a measure in 1921. The milk pasteurizing plants throughout the province are now operating under the direct supervision of the Bureau of Public Health. Dr. Seymour is making a special campaign during 1922 to round up the remaining towns.

The Hon. John Michael Uhrich, M. D., the newly appointed minister in charge of the Bureau of Public Health, and also holding the portfolio of provisional secretary, has practiced medicine in the province since 1908.

Dr. Uhrich is a son of a French veteran of the 1870 war, and was born in Ontario in 1877, graduating in medicine from the Northwestern University of Chicago in 1902.

He has represented Rosthern in the Legislative Assembly since the last general election in 1921.

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"The most despicable case I have known for many years," were the words of Magistrate Heffernan, of Regina, in sentencing a married man to the maximum penalty of $100 or three months' imprisonment, when convicted on a charge of knowingly infecting a young woman of the city with syphilis.

The case was prosecuted by an official of the Bureau of Public Health under the provisions of the V. D. Act, as a result of investigations made when the condition of the girl was first made known.

The girl is now receiving treatment in the free clinics of the Bureau, and is on the way to recovery, but owing to lack of treatment in the early stages, one eye is entirely lost.

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Texas

Dr. J. H. Florence has been appointed by Governor Neff president of the board and state health officer of Texas, succeeding Dr. Manton M. Carrick, who resigned January 20, after serving one year.

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At a meeting of the U. S. Health Institute conducted in Dallas recently, Dr. A. J. McLaughlin, assistant surgeon general of the United States Public Health Service, announced that $30,000 had been set aside by the government to cover expenditures in connection with plague-prevention work outlined for Texas. At the same time it was reported that under the administration of Dr. Manton M. Carrick as state health officer over a million plague-carrying rodents had been destroyed and that the sum

of $175,000 had been paid out for this phase of public-health endeavor.—*Medical Insurance and Health Conservation*, January, 1922.

Washington

About January 16, 1922 the director of public health of the state of Washington notified the county health officer of Thurston County and the city health officer of Olympia that owing to the prevalence of smallpox all pupils in schools were to be considered "contacts" and that regulations of the State Board of Health adopted July 27, 1921 should be complied with. That is, that no teacher, pupil nor janitor be permitted to attend school without presenting satisfactory evidence of having been vaccinated within seven years of the beginning of the term, or present a certificate from the city or county health officer showing that the individual is not in condition to submit to vaccination, such latter certificate to be issued only after the matter was determined by a board of physicians appointed by the board of health. The county health officer then gave notice to the directors of School District No. 1, who issued a bulletin confirming the above regulation and stating that those who did not comply should be excluded from school and isolated in their homes for a period of eighteen days.

The parents of one child refused to comply and filed affidavit in the superior court seeking to have the pupil reinstated. The lower court refused the petition and the case was appealed to the Supreme Court on the legal question of whether the board of health had the power to promulgate and enforce the regulation. The following duties and powers of the State Board of Health are defined by statute: The State Board of Health shall have supervision of all matters relating to the preservation of life and health, shall have supreme authority in matters of quarantine and the prevention or spread of contagious disease, including the enforcement of orders in local matters in case of emergency or negligence. It shall be the duty of local board of health and other officers and employees of the state, county or township to enforce such quarantines as may be adopted by the State Board of Health, with the penalty of fine upon failure to do so. The duty of the director selected by the State Board of Health shall be to enforce all laws passed for the protection of the public health, investigate epidemics of disease and advise local health officers. The Supreme Court upheld the decision of the lower court and affirmed its own previous ruling in the well-known case of State ex rel. McBride v. Superior Court that the acts and rulings of the board of health are final and conclusive and not to be reviewed by the courts or denied because the authority may be abused or the law maladministered, and that the finding of fact by a properly constituted health officer was final and binding upon the public as well as upon the courts—especially as there is no allegation or contention that the action complained of in this case was in anywise arbitrary, capricious or unreasonable. It was decided that the order of the school directors was proper as in compliance with the order of the health officer which they had no right to disregard or disobey in their official capacity any more than as individuals. The contention that the provision in the notice from the school directors that those who do not comply with the regulation shall be isolated for a period of eighteen days was not valid because not embraced in the original regulation of the state board, was not considered or decided by the court as the eighteen days had expired before the case was reached for hearing.

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The Junior Red Cross of Spokane, Washington opened a clinic and hospital in January, 1920, and to date 620 children have been operated on for the removal of diseased tonsils and swollen adenoids. The idea of a clinic and hospital of their own made a strong appeal to the children. The boys in manual training have considered it a privilege to make bedside tables, chairs and cabinets, while the girls have prepared the bed linen, bed jackets, operating gowns, curtains and towels. Even the mentally defective pupils have woven rugs for the hospital floors. Throughout its four years of work in the Spokane schools, there has been entire harmony between the Junior Red Cross organization and the administration of the schools.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst and E. B. Starr.

Definition of the Physician in Industry.—At a recent meeting of the Conference Board of Physicians in Industry, the following definition of the physician in industry was adopted:

> "The physician in industry is one who applies the principles of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention; and who, in addition, has an adequate and coöperative appreciation of the social, economic and administrative problems and responsibilities of industry in its relation to society."

The discussion leading up to the formulation of this definition extended over several months. The question was viewed from all angles and many suggestions were considered for including in the definition an outline of what his duties and functions were.

It was felt, however, that in order to avoid a complicated statement it would be better to include in a definition only the broad fundamental principles upon which the work of the physician in industry is based, leaving to subsequent elaboration the finer details. It was pointed out that the definition adopted should emphasize both the medical attainments and the industrial requirements of the physician engaged in this work in order to make his duties clear both to the medical profession and to industrial management.

It is assumed that the physician engaged in industrial work is well grounded in the fundamentals of medicine and surgery. He is, first of all, a physician. It is obvious, however, that this alone, while equipping him for satisfactory service in private practice, does not meet fully the requirements of industrial work. In his industrial experience he has, of necessity, to deal with questions of sanitation, hygiene, and accident prevention as applied to large numbers of people working in comparatively close association. Only by special knowledge of the work in hand will the physician be able satisfactorily to discharge his duties. His knowledge of plant processes together with the physical examination of applicants for employment and of workers already engaged will enable him by judicious placement to reduce materially the accident and morbidity hazard and rate.

It must be realized that many of the qualifications for successful medical work in industry are of a non-medical nature, and call for a knowledge of the laws of social and industrial economics and of the administrative problems which arise in the conduct of an industrial medical department. The physician in industry must have a clear conception of the responsibilities of the industry to its workers, and through them collectively to the community. On the other hand he should recognize clearly the duties of workers to the industry in which they are engaged. It is an intelligent appreciation and consideration of these problems that make for the success of the work of the physician in industry.

It is hoped that this definition will tend to remove misconceptions as to the work of the physician in industry, and establish his position and his work upon a basis satisfactory alike to the physician and to the industrial organization. Dr. John J. Moorhead is chairman of the Board, Dr. F. L. Rector, secretary, and the membership, about 30 of the leading plant physicians of the country. It is affiliated with the National Industrial Conference Board, 10 East 39th St., New York City.

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The 1920 factory inspection report for the United Kingdom.—"Practically all the continuous industries are now working on the three-shift system, and cases of increased output, substantially greater than the increase of staff, are mentioned in three South Wales works formerly run on the two-shift system."—*Ohio Council on Women and Children in Industry*, April, 1922, p. 6.

Illuminating Engineering Society.—At a meeting of this society at the house of the Royal Society of Arts on February 28, Mr. Leon Gaster, honorable secretary of the society, delivered an address in which he drew attention to the importance of good factory lighting for the health and safety of workers, and as a condition of efficient and rapid work. Experience, he said, had shown a close connection between the prevalence of accidents and lighting conditions; the cost of proper lighting was usually less than 1 per cent of the cost of production, and expenditure to secure it was therefore a good investment, to be regarded as a national asset. Ideal requirements should enable work to proceed at night with the same ease and safety as in good daylight. The necessary conditions had been admirably summarized in the reports issued by the Home Office Departmental Committee on Lighting in Factories and Workshops. General experience indicated that for ideal requirements there are four main conditions to be satisfied, namely: (a) sufficient illumination; (b) constancy and uniformity of illumination over the working area; (c) placing and shading of lights so that no inconvenience and prejudicial effects are experienced from "glare;" (d) placing of lights so as to avoid inconvenient extraneous shadows on the work. There would naturally also be special conditions to be fulfilled, arising from the peculiar nature of any industrial process, and a form of illumination that is ideal for one process may be less satisfactory for another. The home office had for a number of years taken a great interest in industrial lighting, and in this respect this country was in advance of the rest of Europe, but the subject is now receiving attention in various countries, and interchange of views is most desirable in order that any recommendations may be based on commonly accepted general principles. A useful step in this direction was taken by the appointment, at the first technical session of the International Illumination Commission last year, of an international technical committee to review the whole subject. Ultimately it is to be hoped that an international code on industrial lighting may be framed. Mr. Gaster mentioned that this question is receiving attention from the section of industrial hygiene of the International Labour Office established by the League of Nations at Geneva. —*The Lancet*, Vol. ccii, No. 5141, March 11, 1922, p. 506.

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Common Colds in Relation to Industrial Hygiene.—The author summarizes as follows: 1. Every person complaining of nasal obstruction, sneezing and discharge is not suffering from a cold in the head. Learn to differentiate.

2. A careful history will be helpful in the diagnosis. The duration of the symptoms will indicate to a certain extent the character of the affection. A long duration points to a complication or to some disturbance which is not a cold. Inquire into the character of the person's work, the condition under which he works, etc.

3. Differentiate the three stages of a cold and treat the patient accordingly. Do not use irritating antiseptics at any stage.

4. Any case resisting treatment for from two to four weeks should be examined by a rhinologist.—Harold G. Tobey, *Journal of Industrial Hygiene*, Vol. III, No. 11, March, 1922.

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Infectious Arthritis of the Spine.—After citing typical case reports the authors summarize as follows: These cases illustrate the need of particular care by industrial physicians in examining the backs of all employees. Infectious arthritis of the spine is exceedingly expensive both to the employer and to the employee, and is a baffling problem to the industrial physician.

Many times, trivial accidents involving the back are treated as muscular strains, which would be the natural diagnosis from superficial examination.

The duty of the industrial physician, in a word, requires:

1. More attention to the condition of the joints at the time of entrance examination.

2. Prompt and exhaustive analysis of back strain to detect immediately cases of infectious arthritis.

3. Prompt treatment to the focus of infection in an endeavor to eradicate it, and adequate treatment to the diseased area.

The effects of this disease are sufficient to warrant these precautions.—J. F. Curran and S. F. Foster, *Jour. of Industrial Hygiene*, Vol. III, No. 11, March, 1922, p. 342.

Ventilation.—The following is excerpted from the article on Lighting and Ventilation of Factories, Hours of Labor and Health, by Dr. J. S. Purdy, Sydney, Australia, which appears in the March, 1922, issue of the *Journal of Industrial Hygiene*:

"In view of the research of recent years, the whole subject of ventilation has had to be recast. Discomfort with consequent ill health from lack of ventilation, or rather from absence of perflation, is due to the retention of the surplus heat of the body following an increase in the temperature and relative humidity and stagnation of the air. The charge which renders air unfit for human beings is a diminished capacity for taking up heat, which is brought about by an increase in the temperature and in the amount of aqueous vapor in the air. It is necessary, therefore, to ventilate rooms, not because of the excess of carbon dioxide that is to be found where persons are confined in an enclosed space, not on account of the lack of oxygen, not primarily because of any mythical organic poison, but first of all to eliminate the superfluous heat from the bodies of the occupants. This has been definitely proved by recent investigations and experiments by Leonard Hill, Haldane, Flügge and others."

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Census of Safety and Health Workers.—Attention is again called to the effort of the National Safety Council, 168 N. Michigan Avenue, Chicago, to secure certain data required in the Council's census of all persons engaged in safety and health activities in connection with industry. The reader should write directly to the Council for the prescribed blank, or note the form as presented in the JOURNAL for February, 1922, p. 176.

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Industrial Reconstruction Hospital.—As a direct result of the world-wide experiments in rehabilitation of men injured in war, America now has a hospital dedicated solely to the care of industrial diseases and accidents, and the restoration of industrial casualties to active useful life again. This is the Reconstruction Hospital, with its new eleven-story addition at 100th Street and Central Park West, New York City.

The beginning of the new building marks the end of the first year at the present location, during which time the hospital's space and facilities have been taxed to their utmost. It is a new idea to have a hospital where men suffering from any of the many casualties of industry may receive the benefits of an intensive study of their cases by surgeons specializing in all the newest forms of therapy, combined with the complete after-care of the patient until he is fit to earn a livelihood. Yet in the brief life of the present hospital, men have been sent from all over the country to take advantage of its unusual treatment, and many suffering from seemingly incurable physical ailments and distortions have been returned to useful industrial life again.

The addition to this new style hospital will be of limestone and brick. It will have, besides the usual equipment of a modern hospital, the most extensive and complete physio-therapy plant in existence. There will be rooms for occupation therapy, especially designed equipment embodying the latest principles in rehabilitation, electrotherapy, and mechanical apparatus, whirlpool baths, so successfully developed by the military surgeons during the war, and a gymnasium where a score of mechanical devices assist the patient in recovering the fullest use of stiffened joints and weakened muscles.

The plans provide for space for 175 beds in small wards and semiprivate rooms where women and children may be treated as well as men, and recreation and reception rooms for the older patients. There will be a radiophone to help in keeping the patients' minds toned upward as well as their bodies.

The total cost of the new annex will be $1,500,000. It is hoped to complete the first two stories at once to relieve the pressure on the present hospital in which an average of 175 cases receive treatment daily, half of that number being sent by the government.

The officers of the Reconstruction Hospital are: President, W. Gilman Thompson, M. D.; Chairman of the Board of Directors, Allen Wardwell; Vice-Presidents, John A. Hartwell, M. D., Giraud F. Thomson; Treasurer, Edward M. Townsend; Secretary, Elwyn W. Poor.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

Study of Blood Sugar Curves Following a Standardized Glucose Meal.—The basis for the standardization of the technic of the administration of the glucose meal is pointed out. The necessity for such standardization is made clear. The discussion of the many known factors which influence blood glucose curves shows the importance of the consideration of all of them when such curves form part of any study. The pathologic conditions in which the form of blood glucose curve is usually (within certain limits) constant, are: (1) hyperthyroidism and hypothyroidism; (2) hypopituitarism, and (3) diabetes mellitus. There are certain conditions which, in general, show increased curves after the glucose meal. The curves obtained in such conditions do not even approximate the fair degree of constancy found in the above-mentioned conditions. Our present knowledge of glycogenic function in these conditions is rather meager. In this class belong the effects of infectious toxins; those of cancerous origin; those supposedly found in pernicious anemia and leukemia; Hodgkin's disease, etc. Here also belong conditions of the mental states. "Functional" disturbances, usually spoken of as neurasthenia, very definitely disturb the height of blood sugar after a glucose meal.—W. H. Olmsted and L. P. Gay, *Arch. Int. Med.*, 29, 384, (1922).

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The Digestibility of Bacteria.—Bacteria do not adsorb proteolytic ferments. The protein of bacteria is protected from the action of proteolytic ferments by the lipoidal envelope with which they are surrounded. The agencies which destroy this protective mechanism act by disturbing the lipoid distribution. The antibodies present in immune serum do not in any way render bacteria more digestible by trypsin.—C. E. Dukes, *Brit. Med. Jour.*, March 18, 1922.

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The Relationship of Blood Groups to Disease.—The authors have made an investigation of the blood grouping of 2,446 patients at the Mayo clinic with the view of determining a possible correlation of any particular blood group with any particular disease. The main types of disease studied were cases of malignant tumors, leukemias, primary and secondary anemias, jaundice, lesions of the gall bladder, and chronic ulceration of different portions of the alimentary canal. In no instance where the data were sufficiently large to allow the justifiable drawing of a conclusion was any such correlationship found. They point out that in performing work of this nature it is essential, for a correct interpretation to be placed on the results, to take account of the nationality of the patients, for there appears to be considerable variation in the different races with regard to the exact distribution of the blood groups.—Buchanan and Higley, *Brit. Jour, Exp. Path.*, December, 1921; *Brit. Med. Jour.*, March 18, 1922.

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A Comparison of the Formaldehyd-gel Reaction of Gate and Papacostas with the Wassermann Reaction.—The formaldehyd-gel test as used in these experiments is not so reliable a test for syphilis as the Wassermann test with a cholesterinized antigen and water bath incubation. It is not quite so reliable as the Wassermann test with an alcoholic extract antigen. The formaldehyd-gel test gives results in closer agreement with the negative than with the positive Wassermann tests. When the two tests disagree, a positive formaldehyd-gel diagnosis will be found to be correct in an undetermined percentage of cases; a negative formaldehyd-gel diagnosis will rarely be correct. The substance on which the formaldehyd-gel reaction depends is not present in the spinal fluid of syphilitic patients, or at least not in sufficient amounts to cause coagulation on the addition of formaldehyd. Incubation of the serums in unstoppered tubes increases the number of positive reactions, accompanies and is probably dependent on increased desiccation. It will probably be found that inactivation, unless increased evaporation is prevented, also affects the percentage of positive formaldehyd-gel reac-

tions. Heat, aside from the effect on desiccation, does not increase the number of positive reactions. Serum to which a small amount of formaldehyd has been added does not coagulate on exposure to a boiling temperature in a test tube. The ice box temperature delays the coagulation of the positive serums. An increase in the amount of formaldehyd added to the serums increases the percentage of water and delays the coagulation of the positive serums. Suggestions are given for the interpretation of results obtained with the formaldehyd-gel test and for future research.—Victor Burke, *Arch. Derm. Syph.*, 5,469, (1922).

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Wassermann Reaction in Relapsing Fever.—From evidence presented by the author it appears probable that a transient positive Wassermann reaction may be found to be a constant phenomenon during the acute stage of relapsing fever. The transient character distinguishes it from the reactions due to syphilis. If the positive result is observed on every occasion in a particular patient, it may be suspected that he has syphilis also.—H. E. Road, *Brit. Jour. Exp. Path.*, 3, 59, (1922); *Jour. A. M. A.*, 78, 1163, (1922).

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A Micro-Method for the Determination of Sugar in Small Amounts of Blood.—A micro-modification of the method of Folin and Wu is described for the determination of blood sugar in 0.2 c.c. of blood, which may be obtained from the finger or lobe of the ear. No change has been made in the reagents used in the original method of Folin and Wu, and this obviates the necessity of preparing a separate set of solutions. The authors have found the method of value for clinical purposes in supplementing the original method when blood cannot be obtained from a vein.—H. O. Pollock and W. S. McEllroy, *Am. Jour. Med. Sciences*, April, 1922.

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Tubercle Bacilli in the Blood.—The author has examined the blood of 100 cases of tuberculosis (mostly pulmonary) with a view to the detection of tubercle bacilli. He took 4 to 5 c.c. of blood, let it coagulate, removed the serum without touching the upper part of the clot (preferably from the red clear zone), spread on a slide washed with sulphuric acid, fixed with alcohol and stained with Ziehl. Of the 100 cases examined, 52 gave a positive result, mostly where the temperature was raised, and in some scattered tuberculous lesions without pulmonary affection. In 8 early cases tubercle bacilli were found in the blood, although repeated examination of the sputum gave a negative result.—Albertaria, *Tuberculosi*, Dec., 1921; *Brit. Med. Jour.*, March 25, 1922.

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Blood Platelets and Bacterial Agglutination.—When bacterial suspensions are injected into the circulation of immunized rabbits, or of normal rabbits having natural agglutinins, the bacteria are immediately agglutinated and rapidly leave the blood stream. The blood platelets, when present, become attached to a majority of the clumps of bacteria, but both the agglutination and the disappearance of the bacteria from the circulation, of either normal or immunized animals, are just as complete and rapid when the platelets are absent. Suspensions of staphylococcus aureus are not agglutinated, when injected into the circulation of normal rabbits, but the bulk of the organisms rapidly leave the blood stream. When platelets are present they collect into clumps to which many of the cocci become attached before leaving the circulation, but the cocci leave the circulation with equal rapidity when no platelets are present. In this case the bacteria leave the blood stream because the plasma so alters them that they adhere to the endothelial cells of the capillary systems. Virulent pneumococci remain in the circulation of normal rabbits, because they are neither agglutinated nor opsonized. Depending upon the antibody content of the blood, one of three things occurs when artificial bacteremias are produced, viz.: (1) the bacteria are neither agglutinated nor opsonized, and continue to circulate in the blood stream, (2) the bacteria are agglutinated, or are both agglutinated and opsonized, and rapidly leave the circulating blood and collect in the capillary systems of the liver, spleen, lungs, etc., or (3) the bacteria are not agglutinated, but are opsonized and rapidly leave the circulating blood and likewise collect in the internal organs.—Carroll G. Bull and Clara M. McKee, *Am. Jour. Hygiene*, 2, 208, (1922).

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New Method for Gram Stain.—Air dry thinly spread film and fix with least amount of heat necessary to kill the organisms and fix them to the slide. Flood smear with a 1

per cent aqueous solution of the dye to be used. Mix with the dye on the slide 3 to 8 drops of a 5 per cent solution of sodium bicarbonate, allow to stand two to three minutes. Flush off the excess stain with the iodine solution and cover with fresh iodine solution and let stand one minute or longer. Wash in water as long as described and blot off all free water until surface of film is practically free of water, but do not allow the film to become dry. Decolorize with acetone or acetone and ether (1 part ether and 1 to 3 parts acetone) until decolorizer flows from slide practically uncolored. This usually requires less than ten seconds. Blot dry. The slide quickly dries without blotting. Counter stain for five to ten seconds, or longer if desired, with a 2 per cent aqueous solution of Safranine O. Wash off excess stain by short exposure to water, blot and dry.

Steaming the iodine solution of the slide or increasing the period of exposure does not cause the Gram negative organism to resist decolorization. Drying the film after exposure to the iodine solution greatly delays decolorization of the Gram negative organisms. There are two critical steps in the Gram staining method: (a) the removal of the water after the iodine solution and (b) the decolorization. The control of these steps determines to a large extent the amount of differentiation between the Gram positive and Gram negative organisms. The addition of water to the decolorizer, either on the slide or in the bottle, retards the decolorization of the Gram negative organisms and increases the rate of decolorization of the Gram positive organisms. Acetone is superior to absolute alcohol as a decolorizer. It decolorizes the Gram negative organism and debris on the slide much more rapidly and the Gram positive organisms more slowly than absolute alcohol. Mounting the films in distilled water, tap water or physiological salt solution does not affect the staining reaction. Mounting the films in sodium bicarbonate or lactic acid greatly affects the result. The addition of sodium bicarbonate results in a greater concentration of the methyl violet dye being present in the Gram positive organism after decolorization, and lactic acid brings about the opposite result. The failure of Gram positive organisms in old cultures and in smear from the genital-urinary tract to retain the violet dye may be due in part to the presence of certain acids. These facts suggest the possibility of enhancing the value of gentian violet in selective media and improving dye therapy by the addition of an alkali. All of the colon-typhoid group of organisms do not differ from the gonococcus-catarrhalis group of organisms in their resistance to the penetration of the methyl violet dye used in the Gram stain.—Victor Burke, *Jour. Bact.*, Vol. 7, 159, (1922).

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Bacteriology of Feces and Food of Normal Breast Fed Babies.—A bacteriologic study of the feces and the food of normal babies receiving breast milk was made by the authors. During the investigation a "bifidus-like" bacillus was isolated from the breast milk and from the skin around the nipple. It differs from B. bifidus as isolated from nurslings' feces in one respect only, namely its ability to grow well initially under ærobic conditions. B. bifidus is the dominant living type of organism in the feces of normal breast fed babies.—E. W. Brown and A. W. Bosworth, *Am. Jour. Dis. Children*, 23, 243, 1922; *Jour. A. M. A.*, 78, 909, (1922).

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Capillary Cultures of Typhoid Bacilli.—The author comments favorably on the ease, simplicity and reliability of what he calls the capillary method for differential cultivation of bacteria from the stools. After the stool has been well mixed with saline and kept for an hour at room temperature, it is poured into a conical glass or beaker and a strip of filter paper 12 c. long by 1 c. wide is hung in the glass, the end of the paper 1 c. below the surface of the fluid, without touching the side of the glass. After half an hour of this, the paper is pressed on a Conradi plate, and set in the thermostat till the next day. He has applied this method to 800 specimens. It is particularly useful when proteus bacilli are unusually numerous, as they crowd out others on the plates with the ordinary technic. The typhoid and paratyphoid bacilli seem to climb rapidly up into the strip of paper, the colon bacilli following behind. With a dilution of even 1:40,000 he found ten or twelve isolated colonies of typhoid bacilli above the zone of colon bacilli.—S. V. Bagger, *Hospitalstidende*, (Copenhagen) 65, 81, 1922; *Jour. A. M. A.*, 78, 1014 (1922).

The Kottmann Reaction for Thyroid Activity.—To 1 c.c. of clear serum are added 0.25 c.c. of a 0.5 per cent solution of potassium iodid and 0.3 c.c. of a 0.5 per cent solution of silver nitrate. The resulting suspension of silver iodid in the serum is next exposed for five minutes at a distance of 25 c. to a 500 watt Mazda lamp (or other light of equal intensity). Then 0.5 c.c. of a 0.25 per cent solution of hydroquinone is added and the color changes observed at five minute intervals. In carrying out the test, a dark room is theoretically desirable; diffused daylight does not materially interfere with accurate results. The serum used should be freshly drawn, preferably in the morning before food has been taken, and should be free from hemoglobin and quite clear. The test tubes used should be carefully cleaned and of uniform size. A tube 1.5 by 8 c. is quite satisfactory in that it permits thorough mixing of the reagents by gently agitating and rotating the tube. The reagents should be freshly prepared and accurately measured. A slight excess of iodid retards the reaction, while an excess of the silver nitrate accelerates the appearance of the color on development. The color reaction that develops after the addition of hydroquinone varies with different serums. With serum from hyperthyroid cases, Kottmann found that the original yellowish color of the serum mixture persisted for a considerable time; in normal serums a brown color (silver iodid reduced to free silver) makes its appearance quite promptly; in serums from hypothyroid cases Kottmann found the development of the brown color reaction accelerated. The serum from individuals who have had bromides retards the reaction, and such medication must be excluded if the test is to be carried out. The Kottmann reaction seems to offer an index of thyroid activity, and as such should be of value in clinical work. The test is simple, is rapidly carried out, and few other clinical conditions yield serums in which the reaction is delayed to a degree at all comparable with the reaction obtained with exophthalmic serums. Some retardation is noted in other conditions, such as cachexia, and occasionally in pregnancy and in severe excitement, but these conditions should in no way interfere with the clinical interpretation of the test. In only a few cases of clinically active hyperthyroidism was the typical reaction absent (three out of seventy). To be of greatest value, a test of this kind should be studied in a large series of borderline cases, including early tuberculosis and neurasthenia, because they are usually the ones in which a test of this nature is really needed. In a study of 400 serums obtained from patients with thyroid dysfunction, as well as those ill with other disease, and a large group of normal persons, the photochemical serum reaction devised by Kottmann yielded a close index of the thyroid activity. The test is simple and should be of material aid in the clinical as well as the experimental investigation of thyroid problems.—William F. Petersen, F. T. H'Doubler, S. A. Levinson and J. E. Laibe, *Jour. A. M. A.*, 78, 1022, (1922).

Hydrogen Ion Concentration Studies.—The hydrogen method of determining the reactions of fluids used for therapeusis or clinical investigation is of great importance. When fluids that have a higher or lower hydrogen ion concentration than that of the blood are injected into the circulation at the rate or in an amount that the blood cannot neutralize or buffer, reactions characterized by chills and prostration follow. By the hydrogen ion method the authors have determined that distilled water, if not carefully prepared, or when stored as a stock solution, becomes highly acid so that when used as a solvent it may produce a solution with a much higher hydrogen ion concentration than that of the body. Glucose solutions become highly acid when boiled, autoclaved or when permitted to stand for a few hours. Stock glucose solutions as used clinically are highly acid. Physiologic sodium chloride solution, when prepared with stock distilled water or impure salt, may be very acid. A normal or physiologic salt solution makes it isotonic with the blood, but it should also have the same hydrogen ion concentration. These solutions may be easily corrected as to hydrogen ion concentration by the addition of buffer salts. The buffering of glucose and physiologic sodium chloride solutions in the experience of the authors has served to prevent reactions. The authors have studied, and will report in a succeeding paper, the hydrogen ion concentration of sodium citrate solutions, serums, vaccines and antitoxins, arsphenamin preparations, neoarsphenamin and hypodermic medication in both tablet and ampoule form.—John R. Williams and Madeleine Swett, *Jour. A. M. A.*, 78, 1024, (1922).

CONVENTIONS, CONFERENCES AND MEETINGS

This calendar is published through the coöperation of the National Health Council, 370 Seventh Ave., New York City. The Council will be glad to answer promptly any written or telegraphic inquiries regarding meeting dates in order to avoid conflicts.

May 22-26, American Medical Association, St. Louis, Mo.

May 29-30, Ontario Health Officers' Association, Toronto, Canada.

June 5-7, Central Atlantic States Dairy Food and Drug Officials Association, Buffalo, N. Y.

June 5-7, American Association of Engineers, Salt Lake City, Utah.

June 6-9, Canadian Association for Prevention of Tuberculosis and Canadian Public Health Association, The Royal Hotel, St. John, New Brunswick.

June 21, National Conference of Jewish Social Service, Providence, R. I.

June 22-29, National Conference of Social Work, New Biltmore, Providence, R. I.

June 22-24, American Association for the Advancement of Science, summer meeting, Salt Lake City, Utah.

June 24, Eugenics Research Association, Eugenics Record office, Cold Spring Harbor, L. I.

Biennial Congress on Nursing:

June 26-30, American Nurses's Association, Seattle, Wash.

June 26-30, National League for Nursing Education, Seattle, Wash.

June 26-31, National Organization for Public Health Nursing, Seattle, Wash.

June 27-29, Annual Conference, State Sanitary Officers and Public Health Nurses, Saratoga, N. Y.

June 26-July 1, U. S. Bureau of Education and Child Health Organization, Lake Mohonk, N. Y.

July 4-10, National Education Association, Hotel Plaza, Boston, Mass.

July 4, Association Medical Health Officers of Nova Scotia, Sydney, N. S.

July 17-21, National Dental Association, Ambassador Hotel, Los Angeles.

August 22-25, National Medical Association, Washington, D. C.

August 28-Sept. 2, National Safety Congress, Detroit, Mich.

October 16-19, Fifty-First Annual Meeting, A. P. H. A., Hotel Statler, Cleveland, Ohio.

Foreign Meetings:

May 22-27, International Council of Nurses, Copenhagen, Denmark.

May 31-June 5, Royal Institute of Public Health, Plymouth.

June 6-8, French Dermatological Society, Paris.

July 6-8, League to Combat Infant Mortality (International Congress), Paris.

July 11-13, International Union Against Tuberculosis, Brussels.

July 21-28, British Association, Section on Public Health, Glasgow.

CONTRIBUTORS TO THIS ISSUE

(*Continued from page* 515)

gained an insight into the value of preventive medicine. During the World War he held a commission in the Medical Corps of the Army.

Lloyd E. Jackson's varied experience in chemical engineering includes water and sewage research in the Kansas State Board of Health, high explosive work with the DuPont Company, oil and gas analysis in various positions in Oklahoma, and with the U. S. Bureau of Mines. Since 1920 he has held industrial fellowships at the Mellon Institute, at first on corrosion problems in relation to gas producers, and now on cleaning and dyeing problems.

William V. Becker has been associated with mosquito commissions in Essex County (New Jersey), Nassau County (Long Island), and the Pennsylvania Department of Health. From 1920-22 he was supervisor of sanitation in the Philadelphia Department of Health, and is now in private business. He has made extensive researches in the identification, classification flight, and distribution of mosquitoes, and has prepared a complete key to the larvae and adult females of mosquitoes of the United States, for the use of sanitarians.

Miss Hartley Clarke Embrey, food chemist of the Peking Union Medical College, is an American girl who, before she went to the Far East, was in charge of a staff of 30 chemists in a war-time powder plant at Old Hickory, Tennessee. Late in 1921 she was invited to conduct a food research at the Culion Leper Colony on a remote island in the Philippines. Governor-General Wood is greatly interested in the experiment, and Miss Embrey's recommendations on diet for the lepers will probably be made permanent.

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